

ENVIRONMENTAL EDUCATION: TEACHING OUR CHILDREN TO PRESERVE OUR FUTURE

FIELD HEARING

BEFORE THE

SUBCOMMITTEE ON EARLY CHILDHOOD,
ELEMENTARY AND SECONDARY EDUCATION

COMMITTEE ON

EDUCATION AND LABOR

U.S. HOUSE OF REPRESENTATIVES

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ENVIRONMENTAL EDUCATION: TEACHING OUR CHILDREN TO PRESERVE OUR FUTURE

**Tuesday, April 22, 2008
U.S. House of Representatives
Subcommittee on Early Childhood,
Elementary and Secondary Education
Committee on Education and Labor
Washington, DC**

The Subcommittee met, pursuant to call, at 11:00 a.m., at the National Wildlife Visitor Center of the Patuxent Wildlife Research Refuge, 10901 Scarlet Tanager Loop, Laurel, Maryland, Hon. Dale E. Kildee [chairman of the Subcommittee] presiding.

Present: Representatives Kildee, Grijalva, and Sarbanes.

Also Present: Representative Bordallo.

Staff Present: Tylease Alli, Hearing Clerk; and Lloyd Horwich, Policy Advisor, Subcommittee on Early Childhood, Elementary and Secondary Education.

Chairman KILDEE. I know every governor is very busy. And Governor O'Malley I know is especially busy. I read what is going on in Maryland all the time. Two of my children have chosen Maryland as their home. So, Governor, I want to get to you right away.

I am pleased, first of all, to welcome my fellow Subcommittee members, as well as the Chairman of the Subcommittee that has a deep interest in this in the Resources Committee, Madeleine Bordallo from Guam. My son has flown there many times. And he says it is the longest flight in the world. So, Ms. Bordallo, we very much appreciate you being here also.

And we want to thank the teachers and the students. I tell people in real life, I was a school teacher. I was not teacher of the year. I didn't quite make that. I was teacher of the month. So I still have that plaque for that.

This is a very important topic, a topic that Mr. Sarbanes has brought to us and which we hope we can integrate into our bill, No Child Left Behind, teaching our children to preserve our future. I specifically want to recognize him and Raul Grijalva. Raul fights for water out in Arizona. He sees the water here and knows how important that is. And the others who are here today, I also appreciate that.

I thank all the audience, people who have come here because of their deep interest. Because the Governor's time is extremely busy, I will go immediately to Governor O'Malley. And, Governor, thank you for all that you are doing.

**Prepared Statement of Hon. Dale E. Kildee, Chairman, Subcommittee on
Early Childhood, Elementary and Secondary Education**

I'm pleased to welcome my fellow Subcommittee Members, Congresswoman Bordallo, the many students and teachers who are with us today, and our witnesses, to this hearing on "Environmental Education: Teaching Our Children To Preserve Our Future."

I specifically want to recognize Representative Sarbanes for his leadership on environmental education—a number of our witnesses will testify in support of his No Child Left Inside Act—and also for having suggested this beautiful location for today's hearing.

And, I want to thank all the people here at the Patuxent Wildlife Research Refuge for their hard work in hosting us, today. It is especially appropriate that we are discussing environmental education on the 38th annual Earth Day. The purpose of Earth Day is to raise awareness of the environment and promote ways to protect it. And as is the case with so many of the challenges that our country faces, the best answer is education.

Our witnesses will testify about environmental education from a wide range of perspectives and experiences—we have a governor, state superintendent, school principal, two professors, and a recent college graduate who co-founded a biofuel company.

But I believe that in the end, they all will testify in support of the same principles:

- first, that for environmental education to be effective, we must not treat it as separate from other areas of our studies or our lives, but as an integral part of each of them—environmental education can be integrated into math, reading, science, art and virtually any other subject.

- and, second, that if we do not support environmental education, we will—quite literally—jeopardize our children's health and our country's future.

As we will hear, environmental education can be an ideal way to engage even the most difficult to teach students, because it makes learning fun and relevant.

And, I would add, environmentally sound school buildings contribute not only to students' and teachers' ability to learn and to teach, but also to the health of everyone who spends time in schools and to teachers' and principals' and other school workers' job satisfaction.

We will hear that environmental education can get children back into the outdoors where they can get physically fit and learn about healthy eating and the importance of our natural resources.

And, we will hear that good business practices and good environmental practices can be one and the same.

I know that many of you have spent the morning so far engaging in hands-on environmental learning, and I hope that you find this hearing equally interesting and rewarding.

Again, thank you all for being here.

**STATEMENT OF MARTIN O'MALLEY, GOVERNOR, STATE OF
MARYLAND**

Governor O'MALLEY. Mr. Chairman, thank you very, very much and the members of the Subcommittee. Welcome to the great State of Maryland. And to Congressman Sarbanes, thank you very much for your leadership and for your partnership and for really being at the forefront of ushering in a new generation of renewed commitment to the environment.

Mr. Chairman, Dr. Martin Luther King said that the mark of a true education is "intelligence plus character." And for those reasons, I think most of the people that look at the well-rounded education will have to acknowledge that kids do better or children do better in reading and math when they also have the ability to study music and to study art and to become not only students but engaged in science and, in particular, environmental science.

At its core, true education is about teaching our children to be responsible citizens of the world. And what better than Earth Day

to discuss ways to impress upon our children the virtue of service to the common good. It is a time that we set aside to remind ourselves that all of us must “think globally and act locally.”

The No Child Left Behind legislation is designed to help those of us at the state level who embrace the vision of education which believes that connecting students with nature is really an essential part of their development as fully engaged citizens. It is rooted in the hope and belief that today’s young people will do a better job caring for our environment and this increasingly smaller planet than, quite frankly, generations before them have.

When it comes to our children’s attention, nature has a lot of competition these days between the television and the video games and the other attractions of the so-called modern world. And in these difficult economic times, as parents are working two and sometimes three jobs in a single household trying to make ends meet, it is hard to carve out the time to share the outdoors with their children. But schools do play and can play an even greater role in bringing our young people closer to nature.

As we work at the state level to implement more environmental education opportunities in our schools, the No Child Left Inside bill will provide significant assistance by providing grants to support and counterbalance portions of modern education that often emphasize too much the testing day aspects of education without emphasizing the other aspects of a full education.

Yesterday I signed an executive order, Mr. Chairman, which directed our state agencies to work in concert with local, private and nonprofit partners on expanding environmental education in Maryland.

We hope to be the first state in the union to have an environmental literacy plan. And the goal is to create what we call the Partnership for Maryland Children in Nature and charge it with three main tasks: number one, to develop an environmental literacy plan that will create a statewide strategy for implementing environmental education opportunities in our schools; number two, to connect existing camps and other outdoor programs to state learning standards and to increase participation of particularly underprivileged and under-served, historically under-served students.

We already have some promising initiatives underway. Beginning this summer, participants will earn an hourly wage while conducting conservation projects engaging in nature immersion experiences, developing marketable job skills for our increasingly greener economy; and, number three, to increase opportunities for learning and recreation in natural settings.

We are working to connect communities with parks via walkable trails, working with private and local entities to create and improve natural play zones in undeveloped pockets of local parks and neighborhood, and converting asphalt and empty lawns into nature landscapes.

In conclusion, Mr. Chairman, as we recognize Earth Day, we must also recognize that the discussions we make in the here and now will determine what sort of Earth we leave to our children. We will create a generation of environmental stewards who realize humankind sacred responsibility to our land, our air, our water. We have to make the choices now that enable us to do that.

If we invest in environmental education today, it is our belief that there will come a time when our young people graduate high school not only with intellectual abilities but also with a greater connection that creates greater action for a much better Earth to leave to our grandchildren and to theirs.

Thank you very, very much.

[The testimony of Governor O'Malley follows:]

Prepared Statement of Hon. Martin O'Malley, Governor, State of Maryland

Mr. Chairman, Ranking Member Castle, Members of the Subcommittee, thank you for holding this hearing and welcome to the great State of Maryland—we are honored to have you here. Before I offer some words in support of the legislation you are considering today, I wanted to take a brief moment to recognize Congressman Sarbanes, whose leadership and partnership have been so critical to our efforts to return Maryland to progress.

Mr. Chairman, Martin Luther King said that the mark of a true education is “intelligence plus character.” That’s really what this legislation is about. If we truly wish to prepare our children for the challenges of tomorrow, we must recognize that education can be about so much more than reading, writing and arithmetic.

At its core, true education is about teaching our children to be responsible citizens of the world—about instilling them with the ideal that each individual can make a difference, and that all of us must try.

There is no better time than Earth Day to discuss ways to impress upon our children the virtue of service to the common good. Earth Day is a time we set aside each year to remind one another that all of us must “think globally and act locally”—that each of our individual actions have global consequences, and that there is a unity to spirit and matter, and the things we do in this life do matter.

Why this legislation matters

Here in Maryland, we recognize the importance of providing opportunities for citizens to recreate outdoors and we are committed to getting kids re-connected to nature. There is no better way to demonstrate the paramount importance of this issue, than to make sure that all students, regardless of socio-economic status, have the opportunity to experience our great outdoors.

When students are taught environmental education in schools, we know that their learning is enhanced, and that they have better problem solving skills than students who don't use the environment as an integrated learning context.

Research has shown us that spending time outside of the classroom for learning during the school day is important to the intellectual, emotional, and physical health of our children. Moreover, exposing students to the natural world can improve their overall academic success, self-esteem, sense of community, personal health and understanding of the environment.

This issue goes even beyond the scope of environmental education by considering how children grow and learn, and by looking holistically at their development. We must provide for their physical, emotional, and intellectual aptitude.

I believe we must pursue every avenue to reconnect our children with their natural world before it is too late. Environmental education increases student engagement in science, improves student achievement in core subject areas such as reading and math, and increases student awareness about individual actions they can take to restore the health of the natural environment. It is incumbent upon us to make a commitment that will ensure that our children grow to become informed and responsible stewards of the environment. It is our responsibility to make sure they are prepared to address future environmental challenges and opportunities as individual citizens, as members of the workforce, and as parents who will prepare their own children to live responsibly in our world.

Our schools must play a special role in bringing our young people closer to nature because there are increasingly less opportunities for children to enjoy nature outside of the school setting. In these difficult economic times, when parents are working harder and struggling to pay bills, it can be difficult to find the extra time—or for those who do not live in proximity to open space, the extra money—to share the outdoors with their children.

Additionally, when it comes to our kids' attention, nature has a lot of competition these days. Between television, the internet, video games and other distractions, it is fair to say that going for a hike or enjoying the outdoors is not always on the top of every child's wish-list.

As we work at the state level to implement more environmental education opportunities in our schools, the No Child Left Inside bill would provide significant assistance through grants and support, and counterbalancing portions of the No Child Left Behind law which scaled back hands-on learning opportunities and environmental education.

Maryland's response

Maryland intends to be a national leader in assuring that school-aged children have opportunities to learn from nature. As a major step toward this goal, on April 18, 2008, I signed an Executive Order directing Maryland state agencies to work together, along with local, private and non-profit partners, to help our kids reconnect with nature through every avenue available to us. The Executive Order has four key components that will help us ensure no Maryland child is left inside:

1. Partnership for Children in Nature

The Executive Order establishes a Maryland Partnership for Children in Nature that again, includes government agencies and NGOs, to oversee a multitude of state initiatives that will be implemented through public and private partnerships. This Partnership has been tasked with ensuring the development and implementation of a number of key new initiatives; the Partnership will also be responsible for identifying new funding for these initiatives and for evaluating our progress and the progress of our children.

2. State-wide Environmental Literacy Plan

The Partnership has been tasked with developing a state-wide Environmental Literacy Plan to ensure students are exposed to the natural environment at school.

This plan will examine model outdoor programs, model curriculum and professional development opportunities for teachers. It will also look at graduation standards to make sure we are producing environmentally literate graduates. To accomplish this, we will need to identify current resources, existing standards, and current model programs that provide students with meaningful outdoor experiences. As such, we must make sure that our teachers are prepared to provide these types of experiences for students by providing them with exemplary professional development opportunities.

Maryland is fortunate to have some important tools already in place: We have an Environmental Education By-law, we have the Chesapeake 2000 Commitment to provide every student with a Meaningful Watershed or Outdoor Experience, and we have environmental issues integrated into our learning standards. But, we can and must go farther. We will track whether or not our students are graduating as environmentally literate citizens, and we will measure our successes and improve in areas that need improvement.

3. Increase Opportunities for Outdoor Learning

The Partnership is also tasked with increasing opportunities for outdoor learning by connecting our Department of Natural Resources camps and other outdoor programs to state learning standards, and by engaging at-risk youth in outdoor restoration and recreation activities.

By offering more opportunities for structured outdoor learning, it will be easier for teachers to justify attending outdoor programs during the school day by aligning them with the Voluntary State Curriculum learning standards. In this way, students are still learning required content material while being exposed to the outdoors.

Research has shown that exposure to natural areas through mentors dramatically increases stewardship and the willingness to make positive environmental choices. That is why we aim to increase the availability of park naturalists and train staff specifically to work with school groups.

We also aim to increase minority visitation to state public lands. All too often, minorities don't see themselves as being an important contributor to environmental issues. However, the decisions that all of us make on a collective basis have a dramatic impact on the environment. That is why it is important to make the extra effort to reach out to those communities that feel disenfranchised or may not have the resources or background to make informed decisions about the environment.

Additionally, we are particularly excited about our new Civic Justice Corps through which we are recruiting court-involved youth to participate in a summer service program at our State Parks and other conservation lands. On a parallel track we are also recruiting disadvantaged youth from our underserved urban communities—beginning this summer in Baltimore City—to participate in a similar program. Participants in both programs will earn an hourly wage while they conduct

conservation projects, engage in nature immersion experiences and develop marketable job skills for our increasingly green economy.

4. Provide Opportunities for Structured and Unstructured Play

At the state level, we are also looking at ways to provide opportunities for youth to have structured and unstructured time in natural settings for both play and learning. As a result of abundant time spent playing outdoors young people form deep and personal bonds with nature. This connection inspires and motivates children to become stewards of the environment, and enriches their physical and mental well-being.

We want to connect communities with local and state parks through the development of walkable trails that will encourage visitation to these areas. By connecting schools to these public lands, we can encourage outdoor education, environmental clubs, and awareness of the importance of these open spaces.

By expanding schoolyard habitat programs, we will be converting asphalt and empty lawns into natural landscapes that serve as dynamic learning tools for students. Teachers from all subject areas can utilize these spaces, demonstrating to students that math, science, language arts, and physical education are not disconnected and discreet subject areas, but rather integrated topics that enhance their learning.

We will work with private and local entities to develop policies and plans that promote natural play areas. This incentive-based program will provide for the improvement of natural play zones in the undeveloped pockets of local parks and urban and suburban neighborhoods.

Conclusion

We must take actions to ensure that young people develop this stewardship ethic. These actions should manifest themselves through federal, state, local and private initiatives. The No Child Left Inside Act of 2007 will make the United States a world leader in developing this stewardship ethic on a national scale; it will serve as an example for state jurisdictions to do the same on a localized scale; it will set the stage for a sustainable future; and most importantly, it will put the physical, intellectual and spiritual needs of our children first.

As we recognize Earth Day, we must also recognize that the decisions we make in the here and now will determine what type of planet we leave our children. Will we create a generation of environmental stewards who realize humankind's sacred responsibility to our land, our water, and our air? Will they treat our planet better than we did? Will they allow the circumstances they inherit to change them, or will they feel that desire in their hearts to change their circumstances?

If we invest in environmental education today, it is our belief that there will come a time when our young people graduate high school not only with the intellectual ability to tackle complex environmental challenges—but also with the will and desire to care for and save our planet.

Thank you.

Chairman KILDEE. Thank you very much, Governor. Thank you.
[Applause.]

If I could ask just one question, Governor?

Governor O'MALLEY. Yes, sir?

Chairman KILDEE. In your testimony, you described a partnership of state and local agencies, businesses, and nonprofit organizations, many of which I see here today. Can you discuss the importance of making sure that multiple stakeholders are involved in these programs?

Governor O'MALLEY. Yes, sir. You know, we are blessed in Maryland with the tremendous awareness of our proximity to the water and how human activities impact the Chesapeake Bay region. We have a number of great organizations. Many of them are represented here today, all of whom collectively have a tremendous awareness of what assets there are in our state that can be connected to the classroom and to our kids.

For that reason, we want to create a broad-based coalition of people that we can bring into this effort, whether they are the river-

keeper organizations, whether it is the Chesapeake Bay Foundation, and our state park networks and friends, like Parks and People. They are all very important because it is in the overlaying and overlapping of these organizations and their experiences that we really create the opportunities and the multiple opportunities, frankly, for our students not only to engage in the course of the curriculum offered in school, but, as importantly, to engage in after-school hours with the resources that are out there and available to them.

Chairman KILDEE. Thank you, Governor.

Mr. Sarbanes, you have a question of your Governor.

Mr. SARBANES. Thank you, Mr. Chairman. And, again, I appreciate very much your willingness to conduct this field hearing. The whole idea here was we wanted to emphasize the point of bringing children from indoors to the outdoors by doing it ourselves. And we got incredibly lucky with the weather. And so whatever you did to pull those strings, I thank you for that as well.

Governor, your leadership with respect to the environment is well-known to Marylanders and becoming well-known across the country. And I thank you for it.

There is a real synergy between what we are trying to do with No Child Left Inside and what you propose with your executive order because No Child Left Inside is encouraging states to develop these environmental literacy plans and encouraging them by offering funding that can help support activities behind those. And Maryland is clearly positioning itself to be at the forefront and to have that kind of environmental literacy plan when it comes to the federal government and says "We need the resources to support it." So it is I think a great example of the partnership between the federal government and the state government.

My question is with respect to the economic opportunities that can come from getting the next generation on the cutting edge with environmental education, science, STEM, as you mentioned before. But I'm sure as you have attended these conferences of governors across the country, you are hearing about the whole green job movement, which is something that environmental education obviously sets up in a very constructive way.

So I thought you could maybe just speak to the green job movement, how you see the economic linkages with environmental education in the State of Maryland.

Governor O'MALLEY. Sure. I will do my best. We have the urgent necessity to find a much more sustainable way to fuel our economy in the literal sense. And, to that end, there have been a number of initiatives that have taken place over the last 14 months in Annapolis. They have put together sort of the strands of an energy policy that is cleaner and that is greener and that is also much more broad-minded than simply looking at what is coming out the nozzle that goes into the gas tank. What do I mean by that?

We have created a much broader renewable portfolio standard in our own energy consumption in our state, I believe a goal now of 20 percent. We have increased the tax incentives for solar and also geothermal.

We just passed—and I think I am signing tomorrow—is it tomorrow?—two days, Thursday, our green buildings legislation. And we

are requiring our state buildings that are going to be built in the future, that they will have, especially our schools, that they will be built green and that we will strive for those LEED certifications. So these are all efforts that dovetail nicely with environmental awareness and environmental literacy.

In order to create the sort of support and public support for those initiatives, which, yes, may cost a little more today but save us over the long term. It is critically important that our children not only be aware of the civics and that we are a representative democracy but also aware that the most important responsibility we have in securing the blessings of liberty is to be responsible for securing them for future generations. And it is only in the intersection of those two that you create the public will I believe to make this transformation to the green economy.

So they both have to go together. Otherwise our efforts will be short-lived and will pass and fade as leaders pass and fade, but if it can become something that is truly inculcated into every successive generation, then we have the makings for a transformation that is truly revolutionary and in keeping with our American traditions.

Mr. SARBANES. Thank you. Thank you, Mr. Chairman.

Chairman KILDEE. Thank you. [Applause.]

You have half past. Do you want to yield to Mr. Grijalva?

Mr. SARBANES. Yes, sir.

Mr. GRIJALVA. No. Just to thank you, Governor, I appreciate your leadership very much.

This issue is a tremendously important issue because it is about the future. And I am happy to join with my colleague Mr. Sarbanes in pushing that legislation and very appreciative of your leadership.

Chairman KILDEE. Congressman, thank you.

And the gentlelady from Guam, Mrs. Bordallo?

Ms. BORDALLO. Thank you very much, Mr. Chairman. And I, too, would like to go on record to thank the Governor.

It is so appropriate. It is Earth Day today and for your state to take this first step and, of course, to my colleague for introducing this very important piece of legislation.

I have already spoken to him because in reading the legislation, I noticed it emphasized the states. And I told him to be sure and add the territories. [Laughter.]

But I think there is so much talk right now about the global warming, the environment. And it all starts with our children. They must receive this education to protect our environment. And what a great way to start.

I want to congratulate you, Governor and all of the residents of Maryland and, of course, your congressman here, for having the foresight to get this piece of legislation out. And I support it.

Governor O'MALLEY. Thank you.

Chairman KILDEE. Governor, thank you very, very much.

Governor O'MALLEY. Thank you.

Chairman KILDEE. And you go with our good thoughts and our prayers. Thank you very much.

Governor O'MALLEY. Thanks so much. Thank you, Congressman.

Mr. SARBANES. Thank you. [Applause.]

Chairman KILDEE. The Chair will note the presence of a quorum for the record. This record will become part of the permanent record of the Congress of the United States. And 100 years from now, people will be able to read this record in the Library of Congress. So these words are very important.

Pursuant to Committee rule 12A, any member may submit an opening statement in writing, which will also be made a part of the permanent record.

Just a statement of my own. It is especially appropriate that we are discussing environmental education on the 38th annual Earth Day. I can recall in 1965 my first year serving in the state legislature in Michigan coming to Washington to see how to clean up Lake Erie. And we were actually told by most of the people that "It is probably too late to clean up Lake Erie."

They were wrong. Once we quit dumping the gunk and all of the stuff into Lake Erie, it began to clean itself up, not as clean as we would like it but far cleaner than what it was in 1965. And we learned something from that. We have to be great custodians of our waters and of our land.

The purpose of Earth Day, then, is to raise awareness to the environment and to promote ways to protect it. And, as is the case with so many challenges, the best answer is education. If you know, you can do.

Our witnesses today will testify about environmental education from a wide range of perspectives and experiences. You heard the Governor. We will hear the state superintendent, a school principal, two professors, and a recent college graduate who co-founded a biofuel company.

I believe that in the end, they all will testify in support of the same principles, first that for environmental education to be effective, we must not treat it as separate from other areas of our studies or our lives but as an integral part of each of them.

You know, in the math class, when you go out and take specimens, you can count how many per square foot or whatever it may be. You can integrate that into a math class.

In literature, I was a Latin and English teacher. When you talk about Walden Pond, it might be good to find a pond to go out and talk about that. It can be integrated into the system. And I think that should be an important aspect of the bill. And Mr. Sarbanes' bill lends itself to that type of integration.

If we do not support environmental education, we will quite literally jeopardize our children's health and our country's future. We have the opportunity in our generation.

I am 78 years old. What we do will affect me for a few more years. But those children who were here and are here, it will affect them for many, many years. We have a responsibility to them. And they have a great task that we are going to pass on to them.

I would add environmentally sound school buildings contribute not only to students' and teachers' ability to learn and to teach but also to the health of everyone who spends time in schools and to teachers and principals and other workers' job satisfaction.

We will hear that environmental education will get children back into the outdoors, where they can get physically fit and learn about healthy eating and importance of our natural resources.

When I was young, we used to have what was called for the children who were not that healthy fresh air schools. I think every school can provide a real fresh air element. And just look at the opportunities you have here in Maryland. Take students out of the classroom at times. Let them see the assets we have here in our environment.

And we will hear about good business practices and good environmental practices. They can be one and the same. There is no real conflict.

So, again, thank you for being here. Chairman Miller had hoped to be here today, but he is unable. With that, we will call up our panel.

At this point before we call up the second panel, I know you had a question for the Governor, Mr. Sarbanes, but if you have an opening statement, you may do that at this time.

Mr. SARBANES. Thank you, Mr. Chairman. I will keep it brief because I know we want to get started on this excellent panel of witnesses that is coming forward.

I just want to emphasize a couple of things. First of all, I want to thank the staff here at Patuxent Wildlife Refuge for all of the logistical support to make this happen. [Applause.]

I have been here a number of times to various events. And every time it goes off without a hitch. I will knock on wood since I know we are not quite finished, but I think it will go off. And the weather, of course, is beautiful today.

I want to thank the Committee staff for working to help make this possible. Delicia Reynolds on my own staff, who was the point person, I want to thank her for her efforts. [Applause.]

And I just wanted to make a point for the students who are here. And, really, they are what it is all about. And I am going to be very brief because, Mr. Chairman, I might ask one student to come up and for 30 seconds say what he did today just to kind of set the tone for the witnesses that are coming forward.

To me the most important thing is the mutuality dimension of caring for our environment. And I particularly think of that with respect to the Chesapeake Bay. The Chesapeake Bay Watershed, of course, includes six states and the District of Columbia.

And I have gone to members of Congress who represent places in New York and talked to them about how much I care about a stream or river that is in their district. And they have looked a little bit perplexed and wondered why. And then I explain because the watershed begins in your district, as far north, in fact, as Cooperstown, New York.

So the notion that we can escape the obligation to our environment by being a little bit more removed is delusional, really. And the way we are going to save this Bay, the Chesapeake Bay, the way you are going to save it, the way the students who are here are going to save it, is by tending to the needs of our environment, again, right there in their own backyard.

Somebody handed me this Family Circus cartoon from today. I didn't see it. But if any of you have not seen it, you should. It is a picture of these two boys. I don't know their names, actually, the Family Circus boys. They are sitting under a tree, chewing on a blade of grass. And one says to the other, "This is my favorite

learning place: Schoolhouse Earth.” And so that is the point that we are trying to make here today.

Mr. Chairman, if for one minute we could just have Jonathan Baker, who is with Edgewood High School, if I could yield 60 seconds of my time? If you want to just come right up here to the mike and just tell us very briefly—Jonathan is from Edgewood High School in Harford County—what they were doing today?

Chairman KILDEE. Without objection, Jonathan is recognized.

Mr. SARBANES. Thank you very much, Mr. Chairman.

Mr. BAKER. Thank you, everybody. I would just like to say what a great day to be outdoors we have here. I mean, it is Earth Day. It was a nice day out here.

Today what we were doing in the rivers, we were checking for the biodiversity that all the animals and plants that we had out here were. And we were just checking the water quality of this lake here in an ultimate effort to check the watershed area of the Chesapeake Bay. And we found tons of different species of fish and plants and macroinvertebrates, shows that the water quality is good.

But things can always get better, you know. And environmental education, really, for me has taken it to the next level because it provides an authentic experience, where you are outside and you are actually doing things and getting the interest that you need and the commitment that you want.

Mr. SARBANES. Thank you very much. That says it all, Mr. Chairman. [Applause.]

Chairman KILDEE. Thank you very much, Jonathan. Thank you very much.

I am pleased now to introduce our very distinguished second panel of witnesses. Dr. Nancy S. Grasmick is Maryland’s Superintendent of the Schools, where she has served since 1991. Prior to that, she was appointed by then Governor Schaefer as a Special Secretary for Children, Youth, and Families. Dr. Grasmick is widely known for her strong commitment to student achievement, teacher quality, and parent involvement. She has received numerous awards for her service, including in 2005 having the State Education Department Building renamed in her honor.

Dr. Oliver Pergams is Conservation Biologist at the University of Illinois at Chicago, and Director of the Red Rock Institute. Previously he was a Conservation Associate for the Chicago Zoological Society. The Red Rock Institute conducts life science and social science research concerning people’s relationships with nature.

I now yield to Representative Sarbanes to introduce Ms. Harris, Dr. Lawrence, and Mr. Davidson. And I know you will also want to add to my introduction of Dr. Grasmick.

Mr. SARBANES. Thank you, Mr. Chairman.

Yes, we have introduced Dr. Grasmick. If we were to try to go through all of the different accomplishments of Dr. Grasmick, we would have to change this hearing to this afternoon.

I had the distinct pleasure of working with Dr. Grasmick for almost eight years at the State Department of Education as a liaison to the Baltimore City school system. I know of her many achievements and her leadership.

She is one of the longest, I think the longest now, appointed superintendents in the country. And her dedication to children is well-known. On this particular issue with respect to environmental education, she is at the forefront. I think we will hear about that in her testimony. So it is a real pleasure to welcome her here today.

Karen Harris is the principal at Pot Spring Elementary School, which is not quite in my district but I think draws students from my district. So I am very pleased to have you with us today.

She serves on the Board of the Maryland Association of Environmental and Outdoor Educators. She has been in education for 37, almost 40 years now, beginning her career as a kindergarten teacher for Baltimore County in 1971.

In 1990 she was appointed principal of Perry Hall Elementary. And Perry Hall was one of nine Bay schools in the Chesapeake Bay Foundation Bay School Project during her tenure there.

And for the past four years, she has been serving as the principal at Pot Spring Elementary School. And she has served as Chair of the Baltimore County Public Schools Principals' Academy and served in the superintendent's cabinet. We are looking forward to hearing from you today.

Dr. Lawrence is a very distinguished I would say educator, environmentalist, physician, and researcher who has taken on the task of bringing all of these kind of disparate elements when it comes to the benefits of environmental education and sensitivity together, particularly as it relates to public health.

He has founded the Center for a Livable Future at Johns Hopkins. And he has reached out in many, many directions to make the point about how good it is for us from a public health standpoint to be connected to the environment. We are looking forward to his testimony today.

And the last witness is Sean Davidson, Co-founder of Maryland Biofuels. We have asked Sean to be here today to demonstrate the economic opportunities that lie behind environmental sensitivity. And his awareness, as we will hear, was raised in high school. And he took that interest, and he ran with it from a business standpoint and has now founded this company: Maryland Biofuels. You can tell when you listen to his testimony and read it that he is somebody who is going to be part of a larger engine of economic growth that is based in environmental sensitivity and awareness.

So we are thrilled to have all of the witnesses here today and look forward to their testimony, Mr. Chairman.

Chairman KILDEE. Thank you very much.

I want to welcome all of our witnesses today. For those who have not testified before this Subcommittee before, let me explain our lighting system and five-minute rule. The five-minute rule, by the way, applies to the members up here also.

Everyone, including members, is limited to five minutes of presentation or questioning. The green light will be illuminated when you begin to speak. When you see the yellow light, it means that you have one minute remaining. When you see the red light, it means that your time has expired and you need to conclude your testimony. There is no ejection chair, however. So we will be a little discrete up here.

Please be certain as you testify to turn on and speak into the microphone in front of you and turn it off when you are finished.

We will now hear from our first witness, Dr. Nancy S. Grasmick, Superintendent.

**STATEMENT OF NANCY S. GRASMICK, SUPERINTENDENT,
MARYLAND STATE DEPARTMENT OF EDUCATION**

Ms. GRASMICK. Well, good morning and welcome to you, Mr. Chairman. A very special welcome to Congressman Sarbanes and certainly all the members of the Committee. I am delighted to be here today to share information about Maryland's environmental education program. I know that you know that it is very vibrant as you have interacted with our teachers and our outstanding students this morning.

Environmental Education has been required in Maryland since 1990. And it is a major part of the curriculum, and it is a part of the regulations of the State Board of Education.

We have strongly encouraged our systems to provide every child with a meaningful watershed experience each year. And the environmental education program is certainly fuller than that.

Our school systems have been enthusiastic about embracing this requirement in terms of experiential learning. Today we have over 390,000 students in the State of Maryland who participate in environmental outdoor experiences each year.

As was mentioned, we are a part of the Chesapeake Bay 2000 agreement. And the stewardship of that provision called for a meaningful watershed experience for all students before they would graduate from high school.

But we decided that that goal was not rigorous enough. And so we set a more rigorous goal in being a part of that agreement, and we said that every student had to have a meaningful outdoor watershed experience in elementary, in middle, and in high school. And so we have again ratcheted that up to say every child every single year.

We are fortunate to have in Maryland an outstanding environmental educator, who oversees the implementation of the curriculum in each school system. And that is Rebecca Bell, who was with us this morning.

Maryland has integrated the environmental education program in our state curriculum. They are integrated. Those concepts are integrated throughout the curriculum. And we are evaluating students in the environmental education part of this as part of our science evaluation in the elementary school, in the middle school, and in the high school, to ensure those concepts have been taught and mastered by our students.

We are fortunate in Maryland to have only 24 school systems. Nine of those school systems have outdoor environmental programs associated with the school system, with the jurisdiction. I would like to provide one example. It is the North Bay experience.

This is a program that was developed by an outstanding philanthropist in Maryland. We consider it to be so beneficial to our student that the state provides \$1.5 million per year for students to have a week-long environmental experience in this facility. It is

residential. And its focus is certainly for children who are economically disadvantaged to have that opportunity.

The students are prepared for the opportunity to visit this residential site with their science and their environmental curriculum prior to going to the facility. And it becomes a seamless part of the instructional program. There is a deep focus on scientific skills and processes.

When the students leave that week-long experience, there is considerable follow-up for them within their classrooms. They design and implement an environmental project. And then an outside evaluator, independent evaluator, provides data on how beneficial this experience has been for the students and what are the adjustments and improvements necessary.

During their residential week, they also use the environmental experience to integrate with sort of analogies of life situations. So as they learn about things like invasive species during the day, in the evening they identify and discuss invasive things that might be occurring in their own lives. And so they use the environment to expand their repertoire of how this impacts their lives and what are the knowledges and skills they need to deal with those situations.

I was very fortunate to be selected by the National Academy of Sciences to serve on Rising Above the Gathering Storm. And so I am deeply concerned about America's competitiveness in the stem areas: the science, technology, engineering, and mathematics. Our environmental education programs are motivating and engaging for our students at a very early age to consider and nurture students' interests in these STEM areas.

Recently in conjunction with a conference held with Johns Hopkins University, we had a panel of students, high school students, who are choosing as a career path STEM areas. When asked what motivated them, it was precisely these environmental experiences that they had as early as elementary school that they built on as they matriculated through their school experiences.

I think it is time to take environmental education to a whole new level, to move beyond just awareness and knowledge to really action and synthesis. So our slogan is "Every Child, Every Year and, Actually, Every Day."

Thank you very much.

I have a handout for you.

Chairman KILDEE. Very good.

Ms. GRASMICK. We have just published a book called "Feet Wet, Hands Dirty." And I would like to provide this for the Committee.

[The information offered by Ms. Grasmick may be accessed at the following Internet address:]

<http://www.marylandpublicschools.org/MSDE/programs/environment/>

Ms. GRASMICK. Thank you so much.

[The testimony of Ms. Grasmick follows:]

**Prepared Statement of Dr. Nancy S. Grasmick, Maryland State
Superintendent of Schools**

Good Morning Chairman Kildee, Congressman Sarbanes and members of the Subcommittee. Welcome to Maryland! I am delighted to share with you today information regarding the vibrant and robust Environmental Education program we have in Maryland. You have observed a small piece of that this morning with some of our wonderful students.

Background

In 1990, the Maryland State Board of Education adopted a State Regulation (COMAR13A.04.17) requiring the teaching of Environmental Education in Maryland schools. The Regulation outlines the major concepts that are to be included in the curriculum and it promotes a focus on investigating environmental issues. The Regulation does not mandate an outdoor experience because, in Maryland, and I am sure in most of your states, decisions relating to specific instructional activities fall within the purview of local Boards of Education. However, in our role as the state education agency, we strongly encourage our school systems to provide every child with a meaningful watershed experience each year. Our school systems have responded and they enthusiastically embrace the incorporation of outdoor experiential learning as an integral part of the curriculum. Students benefit from learning about their local environment as well as environmental issues at the state, regional, national and global levels.

Voluntary State Curriculum

The Maryland State Department of Education (MSDE) has developed a Voluntary State Curriculum that defines what students should know and be able to do at each grade level. The science curriculum was developed by professional science educators, is based on national science standards and was evaluated by Achieve, Inc. Environmental concepts are integrated throughout the Maryland Voluntary State Curriculum in environmental science, life and earth systems science, economics, geography, and public policy and government. The language in the Environmental Science learning indicators and objectives are adopted from the North American Environmental Education Association. Our 24 school systems have adopted the Maryland Voluntary State Curriculum. Additionally, as required by No Child Left Behind, on a statewide basis, science is assessed once in elementary school, once in middle school and once in high school.

Further, MSDE provides curriculum review and support for many environmental organizations from all over the state in order to help them align their activities with the appropriate curriculum topic at the appropriate grade level. More importantly, the school systems have engaged these environmental organizations to provide their professional expertise to enhance the existing school system curriculum. This approach has fostered thriving partnerships between school systems and their environmental education partners and organizations.

Outdoor Environmental Experiential Learning

Currently, 390,000 Maryland students (45% of our public school population) participate in outdoor environmental learning experiences each year. Some Maryland school systems have been offering outdoor environmental education experiences for almost 40 years.

The Stewardship provision of the Chesapeake Bay 2000 Agreement calls for a “meaningful watershed experience for all students before they graduate from high school.” State Education Agencies in the Bay watershed are required to report student participation numbers to the Chesapeake Bay Program as a measure of their progress towards the fulfillment of the Stewardship Provision. The Chesapeake Bay Program calculated a participation rate for Maryland of 96%. A separate independent poll of the student body conducted by a student at the University of Maryland College Park campus, also found that 96% of the graduates from Maryland schools reported participating in such an experience.

Because Maryland schools were already close to the Bay 2000 goal when the Agreement was signed, lacking only a full experience in Baltimore City at the time, we set a more rigorous goal for our school systems—that they provide a meaningful watershed experience at least once during the elementary school years, once during the middle school years, and once during the high school years. With Baltimore City’s implementation of an experience for all students in 2006, we are once again approaching our goal. Therefore, we have recently ratcheted up our goal once again—to “Every Child, Every Year”. While ambitious, this goal has become the rallying cry for Maryland’s environmental education coordinators, teachers and providers.

Maryland students currently participate in outdoor environmental learning experiences in a variety of ways. :

- as part of the regular science curriculum
- as part of Maryland's Student Service Learning Program. Maryland has received a 3-year federal Learn and Serve grant, which funds community-based environmental experiences for our students. This program has provided additional grade level experiences in 17 school systems.

Providers of Outdoor Environmental Experiential Learning

- Nine (9) of Maryland's 24 school systems fund and operate their own outdoor environmental education centers, sponsoring day trips and residential experiences. School systems that do not have such a facility, partner with state and federal parks, local community groups and non-profit providers to use their sites for similar activities.

- Maryland is fortunate in that we have a large number of informal education institutions that provide opportunities for environmental education, including outdoor experiences. The State provides funding to many of these institutions through the State-Aided Educational Institution Program, so that they may offer free services and/or reduced-price entrance/participation fees to Maryland students. This program provides funding for 50,000 students to participate in programs at organizations such as the Maryland Science Center, the National Aquarium in Baltimore, the Maryland Zoo, and the Chesapeake Bay Foundation.

- The Maryland General Assembly generously appropriated \$1.55 million to fund experiences for sixth graders from across the state at the acclaimed NorthBay program. This nationally recognized program provides a week long residential environmental experience for sixth graders in high need areas. The program is followed by a stewardship project at the school. The NorthBay program has been recognized as the first program to model proper implementation of the issues-based instructional model.

The North Bay Experience

As an example of the many programs we have across the state, I would like to tell you about the NorthBay program. NorthBay is an environmental education center located in Cecil County in northeastern Maryland. The program provides a week long residential experience for high need students. For many students, it is the first time they travel away from home.

The NorthBay curriculum, developed with professional educators, provides a systematic, meaningful watershed experience for sixth graders from high need school districts. All sixth graders from Baltimore City, Somerset, Allegany, Caroline, Garrett, and Cecil counties attend the week long residential program. Title I students from other school systems attend as well.

The curriculum the students experience is the Grade 6 Voluntary State Curriculum in Science, so teachers do not have to worry about time away from their classroom. NorthBay is the classroom. Life science and environmental science goals are the major focus, however the experience also integrates earth sciences, chemistry, reading, writing, and health objectives where appropriate. Scientific skills and processes form the framework of the experience, and the content pieces can be changed to address the issues, interests, and needs of the particular student group. The visit to NorthBay is a seamless part of the instructional year.

Students begin their experience in school by identifying and listing school and community issues. They take their issues list to NorthBay.

At NorthBay, daily instruction is based on a particular skill. For example, on Day 1, students, no matter what activity they are engaged in, discuss the qualities of a good scientific question. On subsequent days, they discuss data collection methods, hypothesizing, using technology to collect data, data analysis and interpretation, decision- problem-solving, and communication of results.

Back at school, students review the issues they identified before their experience, and then choose a problem to address. They apply the scientific skills learned at NorthBay to design and implement a school or community project. Technical support for community and school projects will come from partners within the schools' district.

Students can monitor the data collection throughout the year from their home school to provide follow-up experiences throughout the year. Students learn that they can influence the quality, health, and safety of their own home environment, have the confidence to act, and have the knowledge and skills to do so.

A major focus of the program is on character development and leadership, using the students' environmental experiences as analogies of their life situations. For ex-

ample, students may learn about invasive species in their environment, but also reflect on the “invasives” in their own lives.

Research on Student Achievement

A longitudinal study being conducted by Dr. Marc Stern, Assistant Professor, College of Natural Resources, Virginia Tech uses the NorthBay site to research long-term effects of environmental education experiences on student achievement, preliminary. The study evaluates program effectiveness in three major areas: character development and leadership, environmental responsibility, and academic performance. Dr. Stern submitted the following summary of the findings to date.

“At the outset of our program, NorthBay contracted with an experienced external evaluation team from Yale, Virginia Tech, and Clemson to measure how well we would achieve our goals and to help us continually improve our programs to maximize the positive impacts we could have on visiting students and teachers. The first year’s evaluation report (NorthBay Evaluation: Results from 2006-2007 School Year; Robert B. Powell, Marc J. Stern, and Nicole M. Ardoin; October 2007) investigates our 3 primary goals: Character Development & Leadership, Environmental Responsibility, and Academic Performance & School Culture. The evaluation system looks at short-term and longer-term impacts of our non-formal residential educational programs, which take place during the school year, upon these goals.

The evaluation of the first year of the program clearly indicates statistically significant short-term achievements within all three categories of outcomes. Students exhibited significantly higher scores on survey elements associated with enhanced character development and leadership, environmental responsibility, and academic performance immediately following their NorthBay experiences. Surveys and interviews with teachers confirmed these gains and revealed additional positive impacts upon the educators that attend our programs, including better relationships with their students and the acquisition of new techniques for better motivating their students.

Follow-up surveys conducted with students three months after their visits to NorthBay indicated that statistically significant gains in character development and leadership remained, while most gains related to environmental responsibility and academic performance faded over time. Thus, the evaluation revealed the importance of implementing effective follow-on programs to enhance the positive impacts of our program. We’ve used the evaluation results to develop our follow on program, which we have been actively implementing in over 25 schools throughout the 2007-2008 year. We’ve also used the survey and interview results to improve specific aspects of our program on-site, ranging from specific educational lessons to the logistical execution of our programs.

The evaluation system is an ongoing program designed to continually improve our performance. We regularly use the results to adapt our programs. We’ll also be systematically evaluating the quality of our follow on programs in an effort to ensure that it, along with all of our programming, is the best that it can be”.

This research indicates that students need to engage in multiple experiences in order to develop a stewardship ethic. The study is also significant in that it uses data to improve, not merely justify, environmental education program

A second study indicates that students not only need multiple experiences; they also need a variety of experiences.

Dr. Tom Marcinkowski, Associate Professor of Science and Math Education, Florida Institute of Technology, a nationally recognized researcher in environmental literacy and behavior, states that “We must talk about the different kinds of curriculum content and organization, program organization, and modes of teaching * * * because different kinds of environmental education programs have different kinds of effects on learning. A 1997 review of research pertaining to environmental literacy by Volk and McBeth for EPA clearly indicates that different kinds of programming resulted in effects on different environmental literacy outcomes. For example, Hungerford et al.’s issue-and-action instruction and action research affect problem-solving/issues skills, but not ecological knowledge or environmental sensitivity. Field instruction at schools sites, nature centers, and camps can influence ecological knowledge and environmental sensitivity but have little effect on issue and action skills”.

In light of these studies and others, it is clear that students need to engage in a variety of activities over a period of many years.

Global Competitiveness

There are larger issues facing us in science education as reflected in the report *Rising Above the Gathering Storm*. There is concern that the United States is not preparing a sufficient number of teachers and students in science, technology, engi-

neering and mathematics, and this shortage will affect the United State's ability to compete in an increasingly competitive global economy. Environmental education programs are motivating and engaging for both teachers and students and can be an important part of guiding students to these careers.

In January 2007, Governor Martin O'Malley convened the Base Realignment and Closure (BRAC) Subcabinet, with Lt. Governor Anthony Brown as chair, to coordinate planning for the 25,000 new households and 60,000 new employment opportunities that will accompany the transformation and realignment of federal military bases in Maryland.

The Maryland State Department of Education is working diligently to ensure our students are prepared for these challenging jobs.

In light of these significant initiatives, it is time to take Environmental Education to a new level. Now is the time for us to move beyond awareness and knowledge to action and synthesis.

Today, our focus has been on Outdoor Experiential Learning. But, there is much more happening in our local school systems related to Environmental Education. Environmental education can contribute to addressing the challenges we face both culturally and academically.

We have an extremely effective program in our State. We have more work to do. Every Child, Every Year!

Chairman KILDEE. Thank you very much, Doctor, for your testimony.

Ms. Harris?

**STATEMENT OF KAREN HARRIS, PRINCIPAL, POT SPRING
ELEMENTARY SCHOOL**

Ms. HARRIS. Thank you, Chairman Kildee and Representative Sarbanes, for holding this hearing about environmental education.

For the last four years, I have had the privilege of serving as the principal of Pot Spring Elementary School in Baltimore County. What I do there wouldn't be possible without the support of my superintendent and his vision for environmental education and his inclusion of environmental education units in our curriculum and his constant support of what I try to do with my children.

Four years ago I did begin serving as the principal at Pot Spring. It was my second appointment as a principal in Baltimore County. And when I arrived at the school—it is a school of great diversity. We have 580 students in pre-K to 5. They come from 28 countries and speak 32 languages. We have children who come from homes of great affluence, and we also have a large majority of our students who come from government-subsidized housing and everything in between.

We have very supportive parents. We also have families because they work several jobs who don't have the opportunity to be as supportive at home as we would wish that they are, but they still send us great children.

Our diversity is what makes our school such a rich school, but it also can lead to some issues as helping all children be as successful as we would want them to be.

When I took over Pot Spring, our MSA scores had been relatively flat. The instruction in the school was very traditional in the fact that most children just sat and did worksheets, read from books. The teachers are wonderful. They are still wonderful. But the instruction was very unengaging to children.

The children who had been taught to understand school were very successful. Our students that didn't have that support were not as successful. So our boys underachieved all of our girls in most

of our subtests on MSA, our Maryland State Assessment and as well our minority populations also were under-performing.

I knew I had to make some changes when I took over the school. And I began by changing the culture in the building. I believe strongly that if you want to change teaching and you want to change learning, you have to help your teachers and you have to support your teachers. So I began by looking at how I could bring some very rich and very powerful professional development to my staff.

We began integrating the use of the environment as a context for learning all subjects. It is not a stand-alone. It needed to be integrated into all subjects.

One of the ways I did that was by bringing in very good staff development to help improve the teaching, improve the quality of the work that the students are doing, the learning, and also improve student achievement. And that is the results. I knew I had to integrate all three of those things as well as what we were doing in the school.

All of the staff received extensive training in how to integrate the use of the environment in everything that they were doing. That means all of the staff from the school nurse all the way through the phys. ed. teacher and all the classroom teachers, the guidance counselor. It has to be a whole school focus in order for it to be successful.

They are encouraged to expand their teaching and learning by what we call learning outside the walls. It is not unusual for me to sit in my office and see students doing math, measuring the circumference of a tree outside of my office, or to have children doing perimeters by taking a measuring tool to actually identify the perimeter of a garden that they are planning to do.

Children are encouraged to be writing descriptive phrases by going outside into one of our outside learning areas and sitting in those environments and actually writing, much more engaging than putting an apple on a table and say, "Describe the apple."

The students apply their skills of writing to persuade by writing letters to me, asking permission for them to be able to plant trees outside of their classroom so that they have shade and it will cut down on some of the use of the energy in the building. What an authentic purpose for learning.

The students also write the grants to the Chesapeake Bay Trust, asking for funding for the projects that they have identified themselves as issues on our school grounds. The children have done schoolyard report cards to find out, are there areas of our school grounds that need improvement, are there areas inside our school? And children as young as first graders, kindergartners are working with their teachers to write grants to the Chesapeake Bay Trust, asking for funding, another authentic application of their learning where they have to write anyway. Why not write a grant to important people? It raises the level of what that writing is going to look like.

During lunchtime you can find children in the back of our building creating reef balls. They are artificial oyster reef balls. They are made out of concrete. They work with teachers to create these. In the spring, they are lowered into the Chesapeake Bay on the

Memorial Stadium Oyster Reef in order to help improve the Bay, but it is an engaging math activity. It is team building. Again, it is applying. They are teaching and learning in authentic ways.

Our first graders, you can go down there. They are learning to count by tens by counting bottle caps that have been recycled in our building. They are putting them in bunches of tens. How many tens make 100? How many hundreds make 1,000? They could easily be counting with just chips, but we are recycling. So why not use what we are doing to teach their math lessons?

The teachers purposely involve the students in exploring animals and their habitats, both in and outside of their classroom. There was a natural extension for one of our Baltimore County STEM units in second grade. It is a unit on animals. And so one of our groups of teachers became very passionate about bluebirds and the plight of bluebirds when they attended the MAEOE conference.

They came back with their enthusiasm about what they had learned and tried to encourage some children to also learn about this. The students decided to create a bluebird trail, with some encouragement from those teachers, to attract bluebirds to our school grounds.

Last spring, we had a whole day outside, 580 children outside, for the entire day doing environmental activities. One of the activities was building bluebird houses. In the fall, those bluebird houses were put up around our school grounds.

Each class has been assigned to a bluebird house. They monitor what is going on inside there. They collect the data. They write about it. They write announcements for our school to hear what is happening with their bluebirds. We do have some bluebirds who have landed at Pot Spring.

The teachers have been impressed by the quality of the work that the students are doing, partially because they are writing for authentic purposes. They are learning for authentic purposes. They see reasons for what they need to know.

Why do you need to know perimeter? Well, if you are planting a garden and you need to know how many board feet of wood to put around it, you need to know perimeter. Why do you need to know cubic feet? Well, if you have to find out how much mulch you need for this garden, you need to know cubic feet. It makes their learning meaningful.

Two years ago we began as a school exploring the qualifications to become a Maryland Green School. It was a natural outgrowth for what we were already doing. And the program was chosen for several reasons. It seemed like it would be actively engaging for the teachers and the students. There were opportunities for intensive staff development. The project could be integrated into the curriculum we were already doing at all grade levels. There wasn't a cost. That was a good thing. And the program would help our students become stewards of the environment.

We really liked the idea. The teachers embraced it. The students embraced it. Yesterday we found out we were going to be named a Maryland Green School. Woo-hoo! [Applause.]

So we were very excited.

Over the past four years at Pot Spring, I have witnessed the school's climate and culture change. In addition, there has been im-

provement in academic performance. And that is the reason we are in school to begin with.

Throughout the building, students are collaborating with their classmates. They are applying teacher feedback to the work that they are doing. They are investigating real-life problems in order to make our school and our community and our school environment a healthier place. Students are learning for a purpose, and they know what that purpose is.

Our boys have made great improvements by having the opportunity to learn with hands-on activities. School is not traditionally made for boys. In addition, we have seen a steady improvement on our MSA scores for all of our subgroups. In fact, we have received recognition by the state for continued and sustained improvement on MSA.

My office referrals have also decreased. And so have our out-of-school suspensions. My theory is that the children would much rather be in the outdoors or in their classrooms than sitting in my office.

Our integration of environmental education has been successful for a lot of reasons. I have involved all the stakeholders in the decision-making process along the way. In addition, I have encouraged the staff to teach differently, and I have supported their efforts in teaching this way.

The staff have participated in intensive and ongoing professional development on how to create integrated lessons. Our master schedule provides many opportunities for them to work together. Not only do the teachers need time to work together and learn from each other, but they also need time to learn and work with experts. So that is provided for them as well.

Integrating the use of the environment into all subjects has helped both our students and our teachers make meaningful connections to what they are doing.

My favorite quote comes from a little third grade boy sitting in the middle of a garden writing descriptive phrases. He had not always been an excited learner. And he turned to me, and he said, "Mrs. Harris, this is like recess with learning." I think that wraps it up.

Thank you. [Applause.]

[The testimony of Ms. Harris follows:]

Prepared Statement of Karen Harris, Principal, Pot Spring Elementary School

Thank you, Chairman Kildee and Representative Sarbanes for holding this hearing about environmental education. I am Karen Harris and I am the principal of Pot Spring Elementary School in Baltimore County.

It's been four years since I began my tenure as the principal at Pot Spring Elementary. Pot Spring is a diverse school in the central area of Baltimore County Maryland. We have over 570 students in grades Pre-K-5 who come from over 28 countries speaking 32 different languages. We have children from a wide range of economic backgrounds as well. Many of our students come from affluent families, however we also have a large population that come from government subsidized housing. The diversity of our school is one of the qualities that make it a great school but it is also one of the challenges in creating a high performing school for all students.

When I took over the school Pot Spring's Maryland School Assessment (MSA) scores had been relatively flat for the three preceding years. The boys underperformed the girls on all subtests of MSA. The minority population also underper-

formed the non-minority students. Four years ago the instruction was very traditional. When I talk about traditional teaching, I mean, the majority of work was done through reading textbooks and completing worksheets with teacher directed lessons. There was very little engaging, authentic or differentiated instruction. I knew I had to make some changes so I began by changing the culture. I also knew from experience at a previous school that we would be most successful with a school-wide instructional focus.

We began integrating the use of the environment as a context for learning all subjects several years ago as a way to create more engaging, rigorous and authentic lessons for our students, especially our most reluctant learners. My goal was to improve staff development (the teaching), improve the quality of work we ask the students to do (the learning), and improve student achievement (the results). All of the staff have received extensive training on how to incorporate the use of the outdoors to teach math, reading, science, art, language arts, etc. over the last three years. They are encouraged to expand their classroom by engaging the students in learning “Outside the Walls”. It is not unusual to see students applying their measurement skills to determine the area needed for a garden. Students can be seen writing descriptive essays at our outdoor learning classroom. Students apply their skills of writing to persuade by writing Baltimore County officials for permission to plant trees outside their classroom in order to have some shade on a sunny day. The students also write grants to the Chesapeake Bay Trust asking for funding for their environmental projects. During lunch time our fifth grade “Bay Ambassadors” can be found behind the school creating Reef Balls that will be lowered into the Chesapeake Bay to provide an artificial oyster reef. Some of our youngest students learn to count by tens as they group recycled bottle caps into packs of 100 for our family environmental night. Another example of how integrating environmental education into all subjects has changed our teaching and learning was through a second grade study of animals and their habitats. The teachers purposely involved the students in exploring animals and their habitats both in and outside of their classroom. This was a natural extension to the BCPS STEM unit for second grade. One group of teachers became passionate about the plight of the Bluebird after attending the MAEOE conference and began to inspire the students to discover that our schoolyard was not attracting many native Maryland birds. The students decided to create a bluebird trail to attract bluebirds, which are native to the area. During science they studied bluebird habitats and in social studies they studied neighborhoods and communities. As part of language arts students wrote announcements that were read to the entire school about their project. Last spring at our Earth Day, Every Day celebration, our entire school worked to build Bluebird nesting boxes among other environmental activities. The boxes were installed around our school grounds this year. Each grade has been assigned a nesting box to monitor, collect the data and write about their findings. The teachers have been impressed with the quality of the work the students are producing. The students are motivated and see meaning to their learning—characteristics of high quality work. They are applying reading, writing and math skills to an authentic, real life project that they feel will improve our local environment. We are fortunate in Baltimore County to have curriculum already in place that makes integrating environmental education a natural fit. At Pot Spring we view it as how we do what we do, not an addition to our already full instructional plate.

Two years ago our school began exploring the qualifications necessary to become a Maryland Green School as a natural outgrowth of our integration of environmental education. This program was chosen for several reasons: it seemed like it would actively engage the teachers and the students in the learning process; there were opportunities for staff development that would benefit all teachers no matter what grade or subject they taught; the project could be integrated into the BCPS curriculum at all grade levels; a variety of other schools were involved around the state creating a network for the teachers; there wasn't a cost to the school; the program would help our students become stewards for the environment; and we liked the idea of focusing on environmental science and thought most students would as well. We have documented all of the environmental projects our students have done for the past two years. Our hope is that we will be awarded Green School status this year.

Over the past four years at Pot Spring I have witnessed the school's climate and culture change. In addition there have been improvements in academic performance, behavior, and student achievement. Throughout the building students are collaborating with their classmates, applying teacher feedback to their writing and investigating real life problems in order to make our school and community environment a healthier place. Students are learning with a purpose and they know what that purpose is.

Our boys have made improvements by having the opportunity to learn through hands-on engaging work. In addition we have seen steady improvement in MSA scores for all of our sub groups. Pot Spring has received recognition from both the county and the state for continued and sustained improvement on MSA in 3rd-5th grade. Our office referrals have decreased and so have our out of school suspensions. It appears that students would much rather be in their classrooms than sitting in the office. Classroom instruction is so much more engaging and rigorous.

Our integration of environmental education has been successful for a variety of reasons. I have involved all stakeholders in the decision making process along the way. In addition, I have encouraged my staff to teach differently and supported their efforts to change. The staff have participated in intensive and ongoing professional development on how to create integrated lessons. Teams of teachers have been encouraged to work together to plan integrated lessons. Our master schedule provides daily opportunities for each grade level to collaborate. Not only do teachers need time to work together and learn from each other, but they also need time to work with and learn from “experts” so opportunities have been provided for experienced experts in environmental education to help them on their journey.

Integrating the use of environmental science into all subjects has helped both our students and teachers make meaningful connections to their learning. When students understand a real life purpose and application for their learning, they tend to put more effort into their work.

Chairman KILDEE. I have served in the Congress for 32 years now. And I have traveled throughout the country, visited hundreds of schools. And when I find a truly excellent school, the one constant I find in those truly excellent schools is a strong creative, capable, and caring principal. And you illustrate that very well. [Applause.]

Dr. Pergams?

STATEMENT OF OLIVER PERGAMS, CONSERVATION BIOLOGIST, DEPARTMENT OF BIOLOGICAL SCIENCES, UNIVERSITY OF ILLINOIS AT CHICAGO

Dr. PERGAMS. Chairman Kildee, Congressman Sarbanes, honorable members of the Subcommittee, it is an honor for me to appear before you today to share our research on the declining percentage of Americans visiting nature.

I will share my thoughts on what this trend means for our children’s health and for their environmental attitude as adults. I will emphasize research, showing the most effective way to instill an appreciation for nature is through hands-on nature experiences, incorporated into elementary environmental education. Lastly, I will speak briefly on resulting economic benefits. First I will speak on the declining percentage of nature-based recreation.

Our research published February 2008 shows that people in the U.S. and other developed nations are spending far less time in nature than ever before. With colleague Dr. Patricia Zaradic, I tested 16 measures of nature participation related to visitation of various types of public lands in the U.S. and other countries; number of various types of game licenses issued; and amount of time spent camping, backpacking, or hiking.

The U.S. activities with the greatest participation were visits to U.S. state parks, U.S. national parks, and U.S. national forests. All three visitation rates are in downtrends and are declining on average between 1 percent and 3 percent per year.

Now, during this testimony, I am going to give you three take-home messages. And this is the first. The longest and most complete of the 14 U.S. nature recreation data sets show that ongoing

declines in nature participation, typically began between 1981 and 1991, are losing on average over one percent per year and so far have lost between 18 and 25 percent to the present date. There is no longer any real doubt that the percentage of people involved in nature-based recreation is in long-term decline.

Next I would like to talk about the benefits of nature-based environmental education. The first benefit I would like to talk about is environmental attitude. Our 2007 review of related research suggests that direct contact with nature, especially as children, is the most critical influence on later attitude toward the environment.

Family vacations and time with family and other mentors outdoors are a major influence on later environmental attitude. Environmental education is also important but actually to a lesser degree than direct actual experiences of natural areas.

It is ideal when exposure to nature occurs in the presence of a knowledgeable mentor or teacher. Such a teacher answers questions and helps to convert the rich experience of nature to knowledge and increased curiosity in the student. Direct contact with wild nature, such as hiking, playing in the woods, camping, hunting, or fishing, and, to a lesser extent, domesticated nature, by which I mean things such as gardening or pet care, before age 11 has been shown to be particularly important in shaping environmental attitudes and behaviors in adulthood.

This research is also very important to today's proceedings. It means that—and this is the second take-home message—while classroom environmental education of children is important and absolutely necessary, incorporating as many hands-on nature experiences as possible is what is really crucial. These experiences should be with wild nature if at all possible and with domestic nature as a distant second choice.

Next I would like to talk about the effects of nature, or lack of nature on children's development. Three ways of experiencing nature have been described. Direct experience is undirected play in nature; for example, in a forest, neighborhood park, backyard, or even a vacant lot. Indirect experience includes things like zoos, nature centers, aquariums, and museums. Vicarious experience is without any physical contact with nature; for example, art, photographs, movies, videos, and webcams.

Direct experience with nature plays the most significant role in children's cognitive and evaluative development. Direct experience of nature offers a multitude of continuously changing sights, sounds, smells, and touches that promote a wide range of adaptive and problem-solving responses, alertness, and attention.

The more structured indirect experiences of nature do not require the same level of spontaneous engagement and do not have the same developmental benefits. The least engaging and least spontaneous type of nature contact is vicarious experience through electronic media.

This research is also very important to today's proceedings. It means that—and here is the last take-home message—the nature experiences incorporated should be direct experiences if at all possible; with indirect experiences second choice; and vicarious experiences, "electronic experiences," a very distant third choice indeed. The presence of a teacher or mentor in any case is still necessary.

Just as exposure to nature has positive effects, lack of exposure has negative effects. Children under 13 living in the United States spend on average only about half an hour of unstructured time outdoors each week.

Research suggests that this lack of nature exposure is leading to many developmental problems. For example, five-year-olds limited in playing outdoors exhibited poorer social, behavioral, and motor skills and had fewer playmates than children who played more outdoors.

Children attending a day care center surrounded by orchards, pastures, and woodlands and where the children went outdoors every day, regardless of the weather, had better motor coordination and greater attention capacity than did children who attended an urban day care center surrounded by tall buildings.

Children who moved to housing with more nature nearby tended to have higher levels of cognitive functioning and focus than children who moved to housing with less nature. Activities conducted in natural green settings tend to lower the symptoms of children with ADD, ADHD, and raise self-esteem.

Lastly, I would like to touch upon the economic benefits of nature-based environmental education. I should probably mention that science is a second career for me. My first career was in the financial markets and beginning as a bank foreign exchange trader and ending as owner of a commodities trading firm.

We have seen that elementary environmental education and hands-on nature experiences for children will increase interest in nature and affirm environmental attitudes. This, in turn, will have enormous and beneficial impacts on our use of non-renewable resources and on our economy.

The reduction in health costs relating to increased outdoor exercise will be substantial. Increased interest in nature would raise attendance at our great public lands and reverse the negative trend in U.S. nature-based tourism in general.

In addition, we must consider that a downward trend in the quality of science education has emerged as a national crisis. The percentage of graduate students in science and engineering has declined steadily since 1993. Meanwhile, imports of science and engineering brain power are up almost 40 percent. We must reverse this trend in order to remain competitive in a global economy.

In closing, I recognize that implementing nature-based environmental education will not be easy and will take strong political will and courageous leadership, but I firmly believe that our efforts if we succeed will pay rich dividends for our nation's future generations.

Thank you again for this opportunity to testify. I welcome your questions later on.

[The testimony of Dr. Pergams follows:]

Prepared Statement of Dr. Oliver R. W. Pergams, Director, Red Rock Institute, Inc.; Conservation Biologist, University of Illinois at Chicago

Chairman Kildee, Congressman Sarbanes, honorable members of the Subcommittee, and Governor O Malley: my name is Dr. Oliver Pergams. I am a Director of Red Rock Institute, a scientific research foundation, and am a conservation biologist at the University of Illinois at Chicago. Science is a second career for me: my first career was in the financial markets, beginning as a bank foreign exchange

trader and ending as owner of a commodities trading company. I hope therefore to bring a little broader perspective.

It is an honor for me to appear before you today to share our research on the declining percentage of Americans visiting nature. I will share my thoughts on what this trend means for our children's health, and for their environmental attitude as adults. I will emphasize research showing the most effective way to instill an appreciation for nature is through hands-on nature experiences, incorporated into elementary environmental education. Lastly, I will speak briefly on resulting economic benefits.

I. Declining Percentage of Nature-Based Recreation

Our research published Feb. 2008 shows that people in the US and other developed nations are spending far less time in nature than ever before.¹ This research is included as an attachment to my written testimony. With colleague Dr. Patricia Zaradic, I tested 16 measures of nature participation related to visitation of various types of public lands in the US and other countries; number of various types of game licenses issued; and amount of time spent camping, backpacking, or hiking. The US activities with the greatest participation were visits to US State Parks, US National Parks, and US National Forests. All three visitation rates are in downturns and are declining on average between 1% and 3% per year.

The longest and most complete of the 14 US nature recreation datasets show that ongoing declines in nature participation typically began between 1981 and 1991, are losing on average over 1% per year, and have lost between 18% and 25% to date. There is no longer any real doubt that the percentage of people involved in most nature-based recreation is in long-term decline.

II. Benefits of Nature-Based Environmental Education

The first benefit I'd like to talk about is environmental attitude. Our 2007 review of related research² suggests that direct contact with nature, especially as children, is the most critical influence on later attitude toward the environment.^{3,4} Our article is included as a second attachment. Family vacations and time with family and other mentors outdoors are a major influence on later environmental attitude. Environmental education is also important, but to a lesser degree than direct actual experience of natural areas.^{4,5} It is ideal when exposure to nature occurs in the presence of a knowledgeable mentor or teacher. Such a teacher answers questions and helps to convert the rich experience of nature to knowledge and increased curiosity in the student. Direct contact with wild nature (such as hiking, playing in the woods, camping, hunting, or fishing), and (to a lesser extent) domesticated nature (such as gardening or pet care), before age 11, has been shown to be particularly important in shaping environmental attitudes and behaviors in adulthood.⁴ This research is very important to today's proceedings: it means that:

While classroom environmental education of children is important and absolutely necessary, incorporating as many hands-on nature experiences as possible is crucial. These experiences should be with wild nature if at all possible, and with domestic nature as second choice.

Next I'd like to talk about the effects of nature, or lack of nature, on children's development. Three ways of experiencing nature have been described.⁶ Direct experience is undirected play in nature, for example in a forest, neighborhood park, backyard, or even a vacant lot. Indirect experience includes zoos, nature centers, aquariums, and museums. Vicarious experience is without actual physical contact with nature; for example art, photographs, videos, and webcams.

Direct experience with nature plays the most significant role in children's cognitive and evaluative development. Direct experience of nature offers a multitude of continuously changing sights, sounds, smells, and touches that promote a wide range of adaptive and problem solving responses, alertness, and attention. The more structured, indirect experiences of nature do not require the same level of spontaneous engagement and do not have the same developmental benefits. The least engaging and spontaneous type of nature contact is vicarious experience through electronic media. This research is also very important to today's proceedings: it means that:

The nature experiences incorporated should be direct experiences if at all possible, with indirect experiences second choice, and vicarious experiences a very distant third choice. The presence of a teacher or mentor is still necessary.

Just as exposure to nature has positive effects, lack of exposure has negative effects. Children under 13 living in the United States spend on average only about half an hour of unstructured time outdoors each week.⁷ Research suggests that this lack of nature exposure is leading to many developmental problems. For example, 5-year-olds limited in playing outdoors exhibited poorer social, behavioral, and

motor skills and had fewer playmates than children who played more outdoors.⁸ Children attending a day care center surrounded by orchards, pastures, and woodlands (and where the children went outdoors every day regardless of weather) had better motor coordination and greater attention capacity than did children who attended an urban day care center surrounded by tall buildings.⁹ Children who moved to housing with more nature nearby tended to have higher levels of cognitive functioning and focus than children who moved to housing with less nature.¹⁰ Activities conducted in natural green settings tended to lower the symptoms of children with ADD/ADHD and raised self-esteem.¹¹

III. Economic Benefits of Nature-Based Environmental Education

We have seen that elementary environmental education and hands-on nature experiences for children will increase interest in nature and affirm environmental attitudes. This in turn will have enormous and beneficial impacts on our use of non-renewable resources and on our economy. The reduction in health costs relating to increased outdoor exercise will be substantial. Increased interest in nature would raise attendance at our great public lands, and reverse the negative trend in US nature-based tourism in general.

In addition, we must consider that a downward trend in the quality of science education has emerged as a national crisis. The percentage of graduate students in science and engineering has declined steadily since 1993. Meanwhile, imports of science and engineering brainpower are up almost 40 percent. We must reverse this trend in order to remain competitive in the global economy.

IV. Closing

In closing, I recognize that implementing nature-based environmental education will not be easy and will take strong political will and courageous leadership. But I firmly believe that our efforts, if we succeed, will pay rich dividends for our nation's future generations.

Thank you again for this opportunity to testify. I welcome your questions on these topics.

ATTACHMENTS

1. Pergams, O. R. W. and P. A. Zaradic. 2008. Evidence for a fundamental and pervasive shift away from nature-based recreation. Proceedings of the National Academy of Sciences USA 105:2295-2300.
<http://www.pnas.org/content/105/7/2295>
2. Zaradic, P. A. and O. R. W. Pergams. 2007. Videophilia: Implications for childhood development and conservation. Journal of Developmental Processes 2:130-144. <http://www.redrockinstitute.org/uploads/videophilia2.pdf>

ENDNOTES

¹Pergams, O. R. W. and P. A. Zaradic. 2008. Evidence for a fundamental and pervasive shift away from nature-based recreation. Proceedings of the National Academy of Sciences USA 105:2295-2300.

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⁴Wells, N. M., & Lekies, K. S. (2006). Nature and the life course: Pathways from childhood nature experiences to adult environmentalism. Children, Youth and Environments, 16, 1-24.

⁵Chawla, L. 1999. Life paths into effective environmental action. Journal of Environmental Education, 31, 15-26.

⁶Kellert, S. R. 2002. Experiencing nature: Affective, cognitive, and evaluative development in children. In P. H. Kahn, Jr. & S. R. Keller (Eds.), Children and nature: Psychological, sociocultural, and evolutionary investigations. (pp. 117-152). Cambridge, MA: The MIT Press.

⁷Hofferth, S., & Sandberg, J. 2001. Changes in American children's time, 1981-1997. In S. L. Hofferth & T. J. Owens (Eds.), Children at the millennium: Where have we come from, where are we going? Oxford, England: Elsevier Science.

⁸Huttenmoser, M. 1995. Children and their living surroundings: Empirical investigations into the significance of living surroundings for the everyday life and development of children. Children's Environments, 12, 403-413.

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¹⁰Wells, N. M. 2000. At home with nature: The effects of nearby nature on children's cognitive functioning. Environment & Behavior, 32, 775-795.

¹¹Taylor, A. F., Kuo, F. E., & Sullivan, W. C. 2001. Coping with ADD: The surprising connection to green play settings. Environment and Behavior, 33, 54-77.

Chairman KILDEE. Thank you, Dr. Pergams. [Applause.]
Dr. Lawrence?

**STATEMENT OF ROBERT LAWRENCE, DIRECTOR, CENTER FOR
A LIVABLE FUTURE, JOHNS HOPKINS BLOOMBERG SCHOOL
OF PUBLIC HEALTH**

Mr. LAWRENCE. Chairman Kildee, Congressman Sarbanes, and members of the Subcommittee, I am pleased to be in this beautiful setting on Earth Day to speak about the promise of the No Child Left Inside Act.

As Congress Sarbanes graciously said in his introduction, I am a professor of environmental health sciences at the Johns Hopkins Bloomberg School of Public Health and direct the Center for a Livable Future, whose mission is “to advance an ecological perspective in reducing threats to the health of the public and to promote policies that protect health, the global environment, and the ability to sustain life for future generations.”

Critical to this mission is the education of our children to become stewards of the environment, to develop a healthy relationship with the natural world, and to stimulate their minds and bodies through physical activity, exposure to the wonders of nature, and creative and spontaneous play in safe, natural outdoor settings.

The No Child Left Inside Act will provide the resources necessary to support programs of environmental education. We are in the midst of an epidemic of childhood obesity that puts our children at risk for the first time in our nation’s history to have a shorter life expectancy than their parents.

Many factors contribute to this epidemic. The normal balance of energy consumed in food and drink and energy expended in physical activity has been upset by sharp decreases in physical education and outdoor play, concerns about the safety of children walking or biking to school, increased time watching television or playing computer games, and the consumption of processed foods high in fats and sugars.

Increasing opportunities for regular exercise is crucial to preventing childhood obesity. One of the benefits of No Child Left Inside will be the physical activity associated with nature walks, outdoor play, and field trips to learn environmental stewardships, such as those we have seen today.

The dramatic increase in childhood obesity started soon after the first Earth Day in 1970 and shows no signs of leveling off. Obesity among 2 to 19-year-olds has increased from 5 percent to more than 15 percent in the past 30 years. About two-thirds of our children no longer participate in any organized physical activity. And about one-quarter have no free time physical activity.

Many suburban developments lack open green spaces for free time play. And the very nature of the street design with curving roads and no sidewalks compels parents to drive their children for play dates and other events. Gone are the acres of woodlot at the end of the road where children once explored the natural environment and engaged in hours of spontaneous play.

This year for the first time in human history, half of the world’s population, 3.3 billion people, will live in urban environments. And

it is the rare cityscape that has adequate parkland and natural settings for children to explore.

Environmental education linked to exploration of nature stimulates increased physical activity. Playground activity and active exploration of nature on field trips will increase the energy expenditure while providing other physical and mental benefits.

Time spent in natural settings also provides emotional, social, and cognitive gains for children. Access to green spaces for play and even having views of green settings enhances peace, self-control, and self-discipline among inner-city youth. For rural children, exposure to nature reduces stress, increases their ability to focus, and improves cognitive abilities.

Nature is important to healthy development in children in every major area of growth: intellectual, social, spiritual, and physical. Play and learning in nature is especially important for developing capacities for creativity, problem-solving, and intellectual development.

Finally, our children will inherit a world facing grave environmental challenges, those of global climate change, enough fresh water to meet the needs of people, agriculture, and industry, and adequate food supply, and preservation of biodiversity. We must educate a new generation of environmentally literate citizens to maintain the fragile web of life.

The Paleolithic record shows an average species loss over eons of three to four per year. We are now losing about 1,000 species per year, a number that is likely to rise with continued destruction of natural habitats and global climate change.

The need is urgent for our children to benefit from No Child Left Inside not just for the immediate health benefits described above but for the long-term benefits of raising a new group of intelligent, curious, and committed stewards of the natural world.

Thank you very much.

[The testimony of Dr. Lawrence follows:]

Prepared Statement of Robert S. Lawrence, M.D., Director, Center for a Livable Future, and Professor of Environmental Health Sciences, Johns Hopkins Bloomberg School of Public Health

“Nature-deficit disorder is not an official diagnosis but a way of viewing the problem, and describes the human costs of alienation from nature, among them: diminished use of the senses, attention difficulties, and higher rates of physical and emotional illnesses. The disorder can be detected in individuals, families, and communities.”

—Richard Louv, *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*

The key messages for policy makers in supporting the Sarbanes-Reed No Child Left Inside Act are:

1. Support programs for environmental education and teacher training;
2. Provide additional funding to states that develop environmental literacy plans for grades K-12;
3. Re-establish the Office of Environmental Education within the U.S. Department of Education to provide leadership and oversight of environmental education activities; and
4. Authorize the Secretary of Education to award competitive matching grants to nonprofit organizations, states, and local education agencies for activities to improve and support environmental education that include: 1) advancing content and achievement standards, 2) developing or disseminating innovations or model programs, 3) research, and 4) creating new funding sources.

Introduction

I am very pleased to be here today in this beautiful setting and on the 38th anniversary of the first Earth Day to speak about the promise of the No Child Left Inside Act. My name is Robert Lawrence, and I am a professor of Environmental Health Sciences at the Johns Hopkins Bloomberg School of Public Health. I also serve as the director of the Center for a Livable Future, an interdisciplinary center devoted to research, education, advocacy, and community engagement to address the interactions among the environment, food production, diet, and human health that are all elements of a single complex ecosystem. Our mission is “* * * to advance an ecological perspective in reducing threats to the health of the public and to promote policies that protect health, the global environment and the ability to sustain life for future generations.”

Nothing is more critical to achieving this mission than the education of our children to become stewards of the environment, to develop a healthy relationship with the natural world, to stimulate their minds and bodies through physical activity, exposure to the wonders of nature, and opportunities for creative and spontaneous play in safe, natural outdoor settings, and for some to be inspired to seek careers related to protecting and preserving our natural world for future generations. The No Child Left Inside Act will provide the resources necessary to develop and support programs of environmental education and help reconnect our children with nature.

*Public Health Aspects of Environmental Education**Childhood obesity epidemic:*

We are in the midst of an epidemic of childhood obesity that threatens to produce a generation of Americans who will, for the first time in our history, have a shorter life expectancy than their parents. There are many factors contributing to this epidemic of overweight and obesity among our children and youth and in the adult population. The normal healthy balance of energy consumed in food and drink and energy expended in physical activity has been interrupted by sharp decreases in physical education and outdoor play in our education system, alterations in the built environment, the increasing reliance on labor-saving devices, concerns about safety for children walking or biking to school that places them in buses and cars, increase in time spent watching television or playing computer games, increased consumption of processed foods high in fats and sugars, and the dramatic increase in high fructose corn syrup in soft drinks and juices.

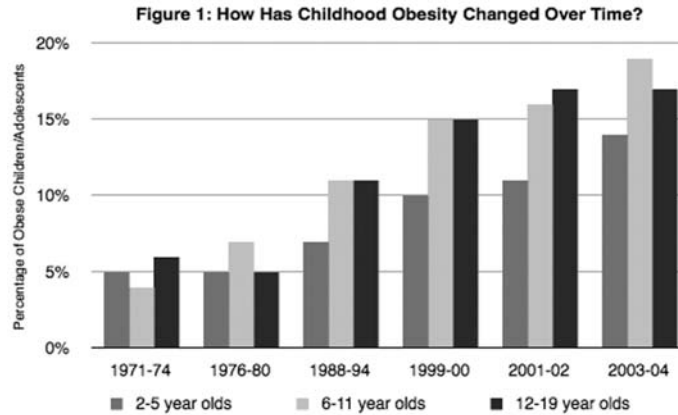
Measures directed at increasing caloric expenditure through regular exercise are crucial elements to preventing childhood obesity and helping children who are currently overweight or obese achieve a healthy weight as measured by age-adjusted body mass index (BMI). One of the benefits of No Child Left Inside will be the additional physical activity associated with nature walks, outdoor play, and participation in environmental stewardship learning exercises such as those sponsored by the Chesapeake Bay Foundation and other environmental groups.

The dramatic and alarming increase in the rate of childhood obesity started soon after the first Earth Day and shows no signs of leveling off. As illustrated in Figure 1 and summarized in Table 1, the percentage of obese 2- to 19-year-olds has more than doubled in the past 30 years (as defined by the 95th percentile for body mass index or BMI by age).

TABLE 1: WHAT PERCENTAGE OF CHILDREN IN THE U.S. ARE OBESE?

[CDC, Overweight Prevalence, 2007]

Age	1972–1974	2003–2004	Percent Change
2-5 years	5.0%	13.9%	+8.9%
6-11 years	4.0%	18.8%	+14.8%
12-19 years	6.1%	17.4%	+11.3%



Source: Centers for Disease Control, *Prevalence of overweight among children and adolescents*

A number of factors contribute to the energy imbalance responsible for these dramatic increases in childhood obesity. About 62 percent of children do not participate in any organized physical activity and 23 percent do not participate in any free-time physical activity. (CDC, 2003) The percentage of children who live within a mile of school and who walk or bike to school has declined nearly 25 percent in the past 30 years. Barely 21 percent of children today live within one mile of their school. (Ogden, 2006) While 71 percent of adults report that they walked or rode a bike to school when they were young, only 22 percent of children do so today. (Beldon 2003)

Suburban sprawl has been accompanied by the design of developments that frequently lack sidewalks or open green spaces for free-time play, and the very nature of the street design with curving roads, lollipop cul-de-sacs, and no sidewalks makes parents feel compelled to transport their children by car for play dates and other social interactions. Gone are the acres of woodlot at the end of the road where children once explored the natural environment, built tree-houses, and engaged in hours of spontaneous play. This year for the first time in human history half of the world's population will live in urban environments, and it is the rare cityscape that has adequate parkland and natural settings for children to explore. (UNFPA, 2007) Over 90 percent of parents say that safety is their biggest concern when making decisions about whether to allow their children to engage in free play outside. (Bagley, 2006) The result of these changes in the built environment and parental concerns about safety is that children now play predominantly at home where their activities are monitored and controlled by adults in contrast to the play of children a generation ago. Only 3 percent of children today have a high degree of mobility and freedom in deciding how and where to play. (Tandy, 1999)

More and more of the time children once spent playing outdoors is now spent in front of a television set or a computer game. In 2003 the Kaiser Family Foundation found that 65 percent of children ages 8 and older had a television set in their bedroom, and 42 percent of children lived in a home where "the TV set is on * * * most of the time, even when no one is watching." (Kaiser Family Foundation, 2003) In 58 percent of U.S. homes, the TV is usually on during mealtimes.

Integrating environmental education linked to subject matter in the classroom to exploration of the natural environment can serve as an important stimulus to increase physical activity. A combination of playground or gymnasium physical activity with expanded opportunities for active exploration of nature on field trips and in the school environment will increase energy expenditure while providing other benefits discussed later. A recent review of childhood obesity prevention co-sponsored by the Center for a Livable Future and the Department of Health, Behavior and Society at the Bloomberg School of Public Health lead to the following recommendations about the school environment:

- Engage students in at least 30 minutes of moderate to vigorous physical activity each day.
- Encourage the consumption of healthy foods by increasing the number of healthy options, pricing those options competitively, and reducing the number of unhealthy foods offered.

- Provide high-quality health education in areas such as nutrition and physical fitness.

Changes are needed for the built environment and for neighborhoods as well. Again, environmental education is an essential component of helping children appreciate nature and find pleasure and stimulation in active play and exploration of the outdoors. The following recommendations address changes needed at the neighborhood level:

- Make communities more walk-able and bike-able.
- Increase access to healthy foods. (Center for a Livable Future, 2007)

The Meatless Monday and Eat Healthy Monday campaigns of the Center for a Livable Future are part of a broader Healthy Monday campaign to use the first day of the week as a motivator to change behavior and lower risk by eating healthier foods, exercising more, quitting the use of tobacco, and adopting other health promoting behaviors. School lunch (and in a growing number of schools, breakfast programs) are ideal venues for introducing Eat Healthy Monday menus and linking these to respect for the land and the environment. The rise of industrial agriculture since World War II has had a profound impact on the number of animals raised in factory settings with devastating impact on the environment, discharge of excess nutrients into watersheds, and the emergence of antibiotic resistant bacteria. These aspects of environmental education can help reinforce the value of eating a healthy diet composed of foods produced in a sustainable way.

The linkage to access to healthy foods includes learning how our food is produced. Now that less than 2 percent of the U.S. population works in the agricultural sector, most children are ignorant of the sources of the food they eat. Environmental education can include learning about the natural cycle of plants and animals, including those that we consume in our diet. The role of community gardens, school gardens, and kitchen gardens should be integrated in environmental education to help children understand the source of healthy foods in contrast to processed foods and snacks while they expand their knowledge of the living world.

Other public health benefits of environmental education:

As important as the benefits of physical activity associated with environmental education and increasing time spent in natural settings are the emotional, social, and cognitive benefits for children. Many studies conducted in recent years show a range of benefits for children when they spend more time outdoors. Taylor and her colleagues found that children with attention-deficit disorder (ADD) benefited from more exposure to nature—the greener a child’s everyday environment, the more manageable are the symptoms of ADD. (Taylor, 2001) Taylor also observed that access to green spaces for play, and even having views of green settings, enhances peace, self-control, and self-discipline among inner-city youth, especially among girls.

For children living in rural areas Wells and Evans observed that exposure to green plants and natural vistas reduces stress. The reduction in stress was greatest in the settings where there are the greatest number of plants, green views, and access to natural play areas. (Wells, 2003) In an earlier study Wells observed that proximity to nature, access to views of nature, and daily exposure to natural settings increases the ability of children to focus and improves cognitive abilities. (Wells, 2000) In other words, by expanding environmental education and increasing exposure to natural settings, No Child Left Inside has the promise of improving learning in all subject areas such as those emphasized by current provisions of the No Child Left Behind legislation.

Nature is important to healthy development in children in every major area of growth—intellectual, social, spiritual, and physical. Play and learning in nature is especially important for developing capacities for creativity, problem-solving, and intellectual development. We need, therefore, to alter our modern built environment to maximize opportunities for children to have contact with nature. (Kellert, 2005) Other investigators describe the benefits of free and un-structured play in the out-of-doors, noting that children will be smarter, better able to get along with others, healthier, and happier. (Burdette, 2005)

Environmental education provided by schools can and should be supplemented by the child experiencing nature in the company of a family member or trusted adult. Chawla states that a positive, direct experience with nature and sharing that experience with a parent, grandparent or trusted adult are the two factors that most contribute to individuals choosing to take action to benefit the environment as adults. (Chawla, 2006)

At the school environment level Bell and Dymont observed that children who experience school grounds or play areas with diverse natural settings are more physically active, more aware of good nutrition, more creative, and more civil to one another.

other. (Bell, 2006) Outdoor experiences for teens result in enhanced self-esteem, self-confidence, independence, autonomy, and initiative with persistence of these traits through many years. (Kellert, 1998) After excluding other variables, a study of students in California and nationwide demonstrated that schools that use outdoor classrooms and other forms of nature-based experiential education produce significant student gains in social studies, science, language arts, and math. One recent study found that students in outdoor science programs improved their science testing scores by 27 percent. (American Institutes for Research, 2005)

Bell and Dymont observed that children in schoolyards with both green areas and manufactured play areas engaged in more creative forms of play in the green areas and also played more cooperatively. (Bell, 2006) They also show more advanced motor fitness, including coordination, balance, and agility. (Fjortoft, 2001) Play is more diverse in natural environments with imaginative and creative play that fosters language and collaborative skills. (Moore, 1997; Fjortoft, 2000) Play in diverse natural environments reduces or eliminates anti-social behavior such as violence, bullying, vandalism, and littering and reduces school absenteeism. (Coffey, 2001; Malone, 2003; Moore, 2000) A number of other studies confirm these benefits of having children spend more time out-of-doors. These benefits of better psychological well being, superior cognitive functioning, fewer physical illnesses, and more rapid recovery from illness apply to adults as well. But the benefits of experience in nature for children are more profound because of the greater plasticity and vulnerability of the young. (Wells, 2003)

Fostering Environmental Stewardship

The world that our children will inherit contains enormous environmental challenges. Among the most important ones are global climate change; sufficient supplies of water to meet the needs of people, agriculture, and industry; adequate food supply; and preservation of biodiversity. Our children must learn the knowledge and skills and develop the proper attitudes to be good stewards of our endangered natural world. Without raising a new generation of environmentally literate citizens it is hard to imagine that we will be able to maintain the fragile web of life, as we have known it. The Paleolithic record shows an average species loss of 3-4 per year. The distinguished socio-biologist, E.O. Wilson, estimates that we are now losing about 1000 species per year, a number that is likely to rise with continued destruction of natural habitats and global climate change. The need is urgent for our children to benefit from No Child Left Inside—not just for the immediate health benefits described above but for the long term benefits of raising a new group of intelligent, curious, and committed stewards of the natural world.

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Chairman KILDEE. Thank you very much, Dr. Lawrence. [Applause.]

Chairman KILDEE. Mr. Davidson?

STATEMENT OF SEAN DAVIDSON, CO-FOUNDER, GREENLIGHT BIOFUELS

Mr. DAVIDSON. Thank you, Chairman, Representative Sarbanes, and members of the Subcommittee, for allowing me to attend this hearing to tell my story of how environmental education impacted what I have done to date.

I would briefly like to introduce myself. My name is Sean Davidson. I am 22 years old. I grew up in suburban Columbia, Maryland, where I currently live.

I work for a company called Greenlight Biofuels, which operates a four million-gallon per year biodiesel production facility in Princess Anne, Maryland. I and a team of two other people co-founded the \$6 million facility.

Biodiesel,—I have some here—which is an alternative fuel for diesel engines, is clean-burning, locally produced, and made from alternative sources, such as used vegetable oils and animal fats.

Compared to regular diesel, burned biodiesel has as much as 78 percent less carbon dioxide and other emissions. It is part of a sustainable environmentally sound solution to our nation's energy needs. I am here to tell the story of how I reached this accomplish-

ment and the role that my environmental education experiences played in it.

Up until middle school, I had very little exposure to environmental education. In late middle school, I and 19 other students won the opportunity to go on a school-sponsored trip to a farm, where we camped and learned about the outdoors.

I thoroughly enjoyed this experience. I looked for more like it and came across Chesapeake Bay Foundation's two-week trip for gifted and talented students, a camping trip that took me in and around the Bay via foot, skipjack, canoe, and van.

I learned the roots of what I would later categorize as the three pillars of environmental education: one, the appreciation and respect for outdoor beauty and its enjoyment; two, the understanding of ecology and the interaction of people with it; and, three, the utility and value of the resources around us.

At the end of the course, they gave us the challenge to do an environmental project in our community. I went on to organize friends to raise for release into the Bay oyster spat and underwater grasses, which are two keystone species in the Bay ecosystem. I also did several trash cleanups.

The lesson I learned was that a person can make a difference in their own sphere of influence, even if it is small. However, I was frustrated with the limitations of not enough money and the difficulty of motivating others to get involved and make a significant impact.

Continuing through high school, I never forgot the importance of the environment and the idea that I can make a change within my sphere of influence. Often this meant simply relating a paper to or doing a research project in school on environmental topics.

After not long, though, I began thinking about what careers would allow me to spend my time making positive environmental impacts. My best ideas were to become an educator or a scientist as the means to have the largest impact within this area of influence. Then when considering these options and how their work is implemented, I began to realize I had a knack for understanding business.

When college rolled around, I began studying business. It wasn't long before this led me to see I could have a profitable business that practiced environmental stewardship. Even better would be a business that made money specifically doing that was something environmentally friendly. In this way I could have the largest possible positive impact.

When I and a partner discovered the market trend that allowed a biodiesel manufacturing business to be economical, we tackled it with conviction and perseverance. It was a marriage of business and the environment that just made sense. So I am here today.

I sit before you, having learned a great deal more about those three pillars of environmental education: appreciation and respect, ecology and interaction with it, and resources and our dependence on them. And I am astounded at how many people around me and the people going through school knew so little in those areas.

Not only have I seen firsthand the lack of environmental education around me, I've read reports and articles speaking to how

our culture and educational system is moving away from these things.

Video games, iPods, laptops, and the internet are often cited as contributing culprits but are no excuse for the lack of a system that gives opportunity for outdoor learning to take place. These outdoor learning experiences were very influential in my own life and prepared me to later develop and build the biodiesel project with the environment in mind.

It may be my opinion, but my experiences have taught me that not only is environmental education needed in our schools today but that it can be successful in its desired goals. Please consider this insight when you consider your support for the No Child Left Inside Act.

Thanks. [Applause.]

[The testimony of Mr. Davidson follows:]

Prepared Statement of Sean Davidson, Co-Founder, Greenlight Biofuels

Thank you Chairman for allowing me to attend this hearing to tell my story of how environmental education impacted what I have done to date.

I'd like to briefly introduce myself. My name is Sean Davidson and I am 22 years old. I grew up in suburban Columbia, MD where I currently live. I work for a company called Greenlight Biofuels who operates a 4 million gallon per year biodiesel production facility in Princess Anne, Maryland. I and a team of two other people co-founded the \$6 million facility.

Biodiesel which is an alternative fuel for diesel engines is clean burning, locally produced, and made from alternative sources such as vegetable oils and animal fats. Compared to regular diesel when burned biodiesel has as much as 78% less carbon and other emissions. It is part of a sustainable environmentally sound solution to our nations energy needs. I am here to tell the story of how I reached this accomplishment and the role that my environmental education experiences played in it.

Up until middle school I had very little exposure to environmental education. In late middle school I and 19 other students won the opportunity to go on a school sponsored trip to a farm where we camped and learned about the outdoors. I thoroughly enjoyed the experience. I looked for more like it and came across the Chesapeake Bay Foundation's two week trip for gifted and talented students. A camping trip that took me in and around the bay via foot, skipjack, canoe, and van. I learned the roots of what I would later categorize as three pillars of environmental education.

1. Appreciation and respect for outdoor beauty and enjoyment
2. An understanding of ecology and the interaction of people with it
3. The utility and value of the resources around us

At the end of the course they gave us the challenge to do an environmental project in our community. I went on to organize friends to raise for release into the bay oyster spat and under water grasses which are two keystone species in the bay ecosystem. I also did several trash cleanups. The lesson I learned was that a person can make a difference in their own sphere of influence even if it is small. However, I was frustrated with the limitations of not enough money and the difficulty of motivating others to get involved to make a significant impact.

Continuing through high school I never forgot the importance of the environment and the idea that I can make change in my sphere of influence. I began thinking about what careers would allow me to spend my time making positive environmental impacts. My best ideas were to become an educator or a scientist as the ways to have the largest impact within my sphere of influence. While considering my career options and their impact I began to realize I had a knack for understanding business.

When college rolled around I began studying business. It wasn't long before this led me to see I could have a profitable business that practiced environmental stewardship. Even better would be a business that made money specifically doing something environmentally friendly. In this way I could have the largest possible positive impact. When I and a partner discovered the market trend that allowed a biodiesel manufacturing business to be economical we tackled it with conviction and perseverance. It was a marriage of business and environment that just made sense and so here I am today.

So I sit before you having learned a great deal more about those three pillars of an environmental education. Appreciation and respect, ecology and our interaction with it, and resources and our dependence on them. And I am astounded at how many people around me and people going through school know so little in those areas.

Not only have I seen first hand the lack of environmental education around me I've read reports and articles speaking to how our culture and educational system is moving away from teaching these things. Video games, iPods, laptops, and the internet often are cited as contributing culprits but, are no excuse for the lack of a system that gives opportunity for outdoor learning to take place.

It may be my opinion, but my opinion through experience that not only is environmental education needed in our schools today but, that it can be successful in its desired goals. Please consider this insight when you consider your support for the No Child Left Inside Act.

Thank You.

Chairman KILDEE. Thank you very much. Thank you very much. I will recognize myself for my five minutes of questions. Superintendent Grasmick, can you expand on some of the ways that environmental concepts are included in Maryland's voluntary state curriculum?

Ms. GRASMICK. Absolutely. It begins in elementary school. It is a specific area where students are not only taught the concepts, there is an expectation of students having outdoor experiences, and that is expanded into middle school and high school. And it goes across our science curriculum, specifically identified as environmental education curriculum. It certainly is integrated into our math curriculum, et cetera.

So every aspect of the curriculum has some contact with environmental education. And, as I indicated, we are requiring that students have an outdoor environmental experience every single year to stimulate this interest.

And in schools such as Pot Spring you heard today from Ms. Harris, students are using environmental education as a part of learning for every subject area within those schools.

And so we do have in reality an unevenness based on often the commitment of the principal, but every school must be teaching these concepts. And we are evaluating that. But to the extent that you heard from Pot Spring Elementary School, I could not say that all 1,600 schools in the State of Maryland have that kind of robust program. However, we are seeing an accelerating interest in this.

Of the 24 jurisdictions, 9 have outdoor educational, environmental educational, settings where students go for residential opportunities to really pursue the preparation they have received in the classroom in those environmental settings and take that back and continue to do projects which will expand their knowledge.

And so we feel very excited about this aspect of No Child Left Inside because we agree with it. And we are saying it is a mandatory part of our teaching in the State of Maryland.

And so Ms. Harris actually has a folder from the Principals' Academy which the State Department of Education supports and initiates. And I do agree with your comment that I have never seen a great school that didn't have a great principal. And so we have organized our State Department of Education to have a special division devoted exclusively to leadership.

And I must say Congressman Sarbanes was a wonderful addition to our department in accelerating the importance of that and some

of the creative ideas, but I am mentioning this because we have this opportunity to influence principals in terms of the creativity of integrating this in all aspects of learning for our students through our principal academies.

Chairman KILDEE. Thank you very much. You know, you draw to mind when I was teaching, pay for teachers is always low. It was low then, too. So I taught summer school. And I taught a class in English literature. This was not acceleration. Mostly all boys who had failed English literature for the regular school year. So they were a pretty strong group of young men.

I came to the poetry section. I figured I'm going to have problems here. They were totally bored. So I went to my principal, Bob Rodda. May he rest in peace. And I said, "Bob, we have behind the school what is called Sleepy Hollow, kind of a wooded area. Could I take my students out there, especially during this poetry section?"

He said, "Dale, you are a professional teacher. Use your professional judgment." And I tell you that was one of the best experiences I had and they had.

And occasionally I would still run into someone in Flint who would say, "My name is" so and so. "You taught me out in Sleepy Hollow." And he remembered that. And it really made a difference in the teaching, that setting there.

Ms. GRASMICK. Absolutely.

Chairman KILDEE. So thank you very much.

And my principal was smart enough to realize that you do work with your teachers, too, right, if they come up with an idea? If it is a good idea, give them some—

Ms. HARRIS. Hire good people and stay out of their way. [Laughter.]

Chairman KILDEE. That is very good. Very good.

Mr. Grijalva?

Mr. GRIJALVA. Thank you very much. Just a couple of quick questions, but I want to thank the panel, informative and very, very important testimony.

I am on this Committee under the able leadership of Mr. Kildee, and I happen to chair a Subcommittee on Natural Resources, National Forests, Parks, and Public Lands. When we had a hearing on the similar subject, I think Mr. Sarbanes made a really good point then, and I think the follow-up is this, that key to this environmental education and No Child Left Behind will be the focus of the school, this, as the departure point for this activity. And I agree it is critical.

You know, we are going through a time right now where the environment at some levels is treated with benign neglect if not disdain. I think environmental education for a lot of reasons is important. I will probably come back to you, Doctor, with a question about that.

As we look at our public parks and our public lands, visitation in some areas continues to go down. And so we need to build not only environmental literacy and sense of stewardship and sensitivity and awareness about the environment, but we need to build a constituency to protect these public places of ours that are so important. And I see this as a very positive outcome of environmental education as well.

The new visitors to our parks in the next decade or two are going to be more urban, more diverse, more family-oriented kind of activities. I think those are all important gains for our public lands because that public support is critical to their existence.

If I may, Ms. Harris, you mentioned something in your testimony about changing the culture of the school. You know, we are faced with this culture that you have to teach to the test. And so as you talk to other educators, they make it an either/or proposition. Either I prepare and teach for the test or I do those other extra-curricular things: music, art, environmental education.

Tell me why in changing the culture you don't think it is an either/or proposition or should function that way.

Ms. HARRIS. It is a dilemma because we do a lot of assessment. And we are held accountable. At our school system, we are held accountable for the Maryland voluntary state curriculum. And I truly believe in it. And I know that we are holding our children to a very high standard.

That doesn't mean that you have to teach to a test. Good teaching is good teaching. They need to understand what it is that the children are going to be responsible for learning. You can teach that through a variety of contexts.

I believe strongly that if you show children the purpose and the reason for learning something, then they understand why to learn and they are invested in learning it. If they are applying that knowledge and those skills in authentic ways, then they have a purpose for their learning. That will equate to better test results.

If we teach children, they have to learn how to read. They have to learn how to write. But if they have a purpose for their reading and they understand "I need to be able to learn more about what is happening with erosion on my school grounds so that I can create a project that is going to overcome those issues," then I have a deeper understanding of why I am reading about this, I am going to invest more time. It is also more engaging.

One of the things that I noticed when I was at Pot Spring—I don't think my staff knows this, and I have several of them here. So I am going out on a limb here, but when I first walked through my building, we had a lot of children who had been taught how to play school. And they did it very well. The teacher would be in the front of the classroom teaching their little heart out, and the children are building airplanes in their desk. And that is a true story. They weren't engaged. They looked like they were learning. But they weren't engaged in the learning process.

Now you go into classrooms in my school. And children are working in groups. They are working together. They are creating very meaningful work at a very high level because that work is going to be read by important people. They understand that they just can't write garbage.

I think that all of that has equated to our students learning at a higher level. And that equates to higher test scores.

Mr. GRIJALVA. Thank you.

Ms. HARRIS. We don't teach to the test.

Mr. GRIJALVA. Dr. Lawrence, one of the cornerstones of the legislation is to reestablish the Office of Environmental Education within the Department of Education. Do you have comments on that?

Mr. LAWRENCE. Well, I think the mixture of environmental education to provide the knowledge base for becoming responsible stewards of the environment is a big part of it, but, as the previous comments have been focused on the ability of children to learn, Dr. Pergams and I cited much of the same literature in our testimony because it is a relatively new phenomenon for people to be concerned about what is happening to our children with regard to their physical inactivity, with regard to how little time they spend out in nature.

And study after study is showing that, indeed, something really good happens to the way our minds work when we are stimulated, as we all are today, by the variety of colors, the sounds, the bird song, the spring flowers. All of that is doing things in our complex nerve net that makes us then absorb other cognitive information more readily.

We don't know how that happens yet. And we may never know it is such a complicated way in which our brain processes information, but I think the knowledge base of what is happening to our environment and then the experience in the environment to allow us to function more effectively and for children to become better problem solvers is absolutely essential. It is a hand in glove phenomenon.

And it is very easy to get quite pessimistic about the outlook for the Earth's planet. You know, we are adding two to three parts per million of carbon to the atmosphere every year. We are already about 100 parts per million above historic highs. All of this is going to impact the current generation of children in a profound way, as Chairman Kildee said in his opening remarks.

Those of us in the later years of our life, we're not going to benefit much from dramatic change, but our legacy, what we leave our children and our grandchildren, is absolutely at the center of a moral relationship with the natural world. And somehow the only way that children can acquire that is to experience it directly and then have that stimulate other curiosity, as we have heard from Mr. Davidson.

Mr. GRIJALVA. Thank you very much.

Chairman KILDEE. Will you yield?

Mr. GRIJALVA. Absolutely.

Chairman KILDEE. I just was very happy to hear you use the word "moral" because we do have a moral responsibility, not just for my own—I have seven grandchildren, but for all the children around the world. We have a tall responsibility to them.

And I would like to think that we could leave the world a better place in every way than it was when we entered it. But we know that environmentally we have not done that, but we have the opportunity and we have the obligation and we have the moral obligation to do that.

And I am very happy that is a part of your—

Mr. LAWRENCE. Thank you.

Chairman KILDEE. Thank you.

Mr. GRIJALVA. Thank you.

And, just in closing, I was watching one of my favorite philosophers on TV the other day, George Carlin. [Laughter.]

And he said a very profound thing. He said, "Whatever happened to that kid playing outside with the stick?"

With that, thank you very much. [Applause.]

Chairman KILDEE. The gentleman from the great State of Maryland, Mr. Sarbanes?

Mr. SARBANES. Thank you, Mr. Chairman. I want you to know I am restraining the impulse to ask you that all of our hearings going forward be outside. [Applause.]

Chairman KILDEE. He is the one who insisted they be outside.

Mr. SARBANES. That is right.

Chairman KILDEE. I have to wonder how——

Mr. SARBANES. We rolled the dice.

Chairman KILDEE. Thanks for insisting.

Mr. SARBANES. Thank you. And I wanted to also thank Chairman Grijalva for his leadership on the Subcommittee of Natural Resources that I have the privilege of serving on.

Ms. Harris, I was intrigued when you were talking about the bluebird nesting box project that engaged some of your students because my son, who I mentioned before, is a very avid birder and bird photographer now. In fact, tonight or Friday he is going down to be a guide at the Delmarva Birding Weekend on the Eastern Shore.

He first got interested in birds because he went to a Maryland State Department-sponsored, State Department of Education-sponsored, bluebird camp in western Maryland, in Washington County. And he came back from that experience just completely converted.

In May, he is going to Texas to participate in a four-day Texas birding classic competition, which I don't think the Superintendent here knows. So I can say this is going to mean he is going to miss a day and a half of school. [Laughter.]

Mr. SARBANES. And when I confronted him with that problem, he said, "Well, you are the one who says we have to get out of school and into nature." [Laughter.]

I said, "I meant out into a class outside, not away from school." But, in any event, it just shows how these early experiences can grab hold of a child and steer them in these wonderful directions.

I was wondering if you, Dr. Grasmick and you, Ms. Harris, could speak. We talked a lot about the benefits of the children of environmental education. But I have to imagine that the effect, the positive effect, it is having on teachers in terms of them feeling renewed and engaged and excited about their ability to reach and teach their students is also something to behold.

And I wonder if you could speak about that in terms of the experience in your own school and then, Dr. Grasmick, across the state what you are seeing with that.

Ms. HARRIS. I do have a wonderful staff. And I am very blessed to be their leader. One of the things that they have said to me over time since we have been doing this kind of teaching and learning is that it has brought the fun back into teaching.

Because the state mandates and the federal mandates for success for all children truly is what drives what we do, there are occasions where that becomes more teaching to the test or can become more teaching to the test and you become so enmeshed in just teaching,

in book learning, and making sure that they are writing and it is all just so intense that it has taken some of the fun out of teaching.

And my staff, I encourage them. I am out there with them. But I say, "Get them outside." The video that you could pick up, actually, is part of my children and my staff outside at the stream near our school.

They have to teach what is required. They have to learn what is required. But can't we do it in a fun way? And I thinking learning and teaching should be fun.

It is a very difficult job. They have an enormous stress, an enormous amount of responsibility to make sure that their children are ready for the next year and ready for the world. But they can do it in a different way and still get great results.

So I really cheer them on. I feel my job is to hire great people, to support what they are doing, to give them the staff development that they need to be successful, to join them in the joy of teaching and learning, and then really to get out of their way and say, "It is okay. You are doing good things."

Mr. SARBANES. Thank you.

Ms. HARRIS. So I have several of them here, and they are very enthusiastic people. But, again, I am very lucky to have them.

Ms. GRASMICK. I would say from the perspective of the entire state—and I do want to acknowledge her. She is right behind me, Rebecca Bell, who does an amazing job in working with our teachers, in setting up the summer centers, as you alluded to with your son.

What I have seen that is so profound as I travel around the state is the retention factor of teachers in schools where they can integrate this experience and knowledge of the environment with the teaching across subject areas.

I was just in one of the most heavily impacted urban schools in terms of circumstances of poverty. And when I walked through the door, it was like an oasis. And we have identified that as one of our six blue ribbon schools in the State of Maryland.

And by all circumstances and what stereotypically would be expressed is teachers would not want to be there. And, yet, year after year there's 100 percent retention of teachers because of the creativity, because of this integration of the opportunities for students through the environmental experiences that they have beyond that narrow community and the creativity of the teachers that have been described in a suburban school.

And so I see it as both motivational for teachers, contributing greatly to teacher retention, teachers feeling creative, and I also see it as fostering a new cohort of teachers.

When I spoke about the students who were high school students who were at this conference I had with Johns Hopkins and they were talking about the STEM areas and talking about what they want to do as a career path, they weren't necessarily talking about being engineers. They were interested in engineering, but they were talking about becoming teachers. And that stimulation began in elementary school for these students with the experiential learning that they had.

And so we are fostering perhaps a whole new cohort of teachers. They see teaching through different eyes, not as regimented but as

a creative profession that does this kind of integration on the environment with the subject material.

Mr. SARBANES. I guess what I am hearing is in a sense, it is a disservice to our teachers if we don't give them this environmental education resource to use with their students.

Dr. Pergams and Dr. Lawrence, thank you for being here. I heard in I think, Dr. Pergams, your testimony a suggestion—or maybe it was Dr. Lawrence, but I would like to have both of you react to this—the notion that you can't teach about the environment if you are not in the environment.

And maybe you could just sort of build on that concept or flesh it out a little bit more because I think it relates to this notion that we can somehow turn environmental stewardship over to experts when, in fact, the only way we are going to save the environment and combat global warming and save the Chesapeake Bay is if all of us begin to have the habits that will do that.

So we need guidance and leadership from the experts, but we have to own it ourselves. And in the same way, you just can't teach in a classroom inside four walls that environment is important if you are not actually outside in the environment. Maybe you could speak to that.

Dr. PERGAMS. I think the research backs this up, and it is also my own personal experience from taking kids into nature and for my own children that learning about nature without going there is just like learning any other subject.

But if you go into nature and if you—it can range from just simply playing outside in a forest or a vacant lot or going on a field trip with a teacher or going, you know, Boy Scout camp with a leader that knows something about nature.

What is important I think is the great variety of input that children get in the huge, beautiful, chaotic world of stimulus that the children get and the vast demands it makes on their neural net and their developmental progress.

So I think you re-create this kind of complex, chaotic world in a movie or a webcam or a book. And that is I think really the difference here. You don't know. When you go out into nature, you don't know what is going to happen, actually. You don't know what you are going to see when you turn over that log. You know, you don't know what you are going to get when you sweep that net into the pond.

It is unpredictable. And, therefore, it is wonderful. And, therefore, it has an incredible influence on their children's developmental and cognitive progress.

Dr. Lawrence. I would just supplement that a little bit by saying that recent understanding of neural development in the child reinforces everything that Dr. Pergams said. We now understand that, in fact, an infant has many more synaptic connections among cells in the brain than we do as adults. And those synaptic connections are in great redundancy. When they are not used, they start getting pruned.

And so if you don't begin learning a second language by a certain age, if you don't take up a musical instrument by a certain age, if you don't begin to understand how complex the web of life is by a

certain age, those potential synaptic connections are going to get pruned.

And that is why early exposure to children, to the wonders of nature has an explanation that we are beginning to be able to connect the dots and say, "This is stimulating a certain part of the cortex. This is keeping some of those synapses together and, in fact, stimulating the creation of additional ones."

So pattern recognition, hands-on, scooping the net, as the children and young people did today, in the ponds, and counting the variety of natural organisms, that is stimulating their brains in a way that sitting in front of a video or reading a book just doesn't do it.

It doesn't mean that we shouldn't complement and supplement and integrate standard methods of educational approach with hands-on, but the more we learn about the way the brain matures and develops, the more powerful is the idea that we need to have these kinds of hands-on experience.

I would also say that there is this whole interesting phenomenon of trying to begin to integrate concepts of natural capital with social capital as well as financial capital for development and so on.

And it is the opportunity to work together as they were working together that creates social capital. And the social capital is what was described by our colleagues that they are beginning to see in positive ways in the schoolroom and among teachers. And all of that then begins to really reinforce.

So it is very powerful. And it fits in with what is evolving in our understanding of the way the human mind works.

Mr. SARBANES. Thank you.

Mr. Chairman, I am sure I am out of time. I had a real quick question for Mr. Davidson.

Chairman KILDEE. Go ahead.

Mr. SARBANES. I was just curious. You are now moving in an arena where there are others that are in these places where, as you put it, business marries the environment. And I am wondering if you have encountered others who got into their business because they had their sort of environmental awareness raised at some point along the way.

Mr. DAVIDSON. I have, actually. For example, in my experiences that I went through, not only is it awareness that is created, but it is appreciation, love, respect, which kind of breeds a passion in a person that is required when you go to start a business.

I think I briefly mentioned that we tackled it with conviction and perseverance. You know, that is borne from the passion that we got, you know, for me partly from my experiences and my desires to do something significant with the environment. In the other business leaders I meet I could see that passion reflected, especially strong when it is in what they are doing, when their business matches their environmental agenda.

And I have met some people in Maryland and elsewhere that have gone that route.

Mr. SARBANES. So the drive that is needed to succeed in business can come from having had this environmental passion.

Thank you, Mr. Chairman. I appreciate it.

Chairman KILDEE. Dr. Lawrence, before I call upon the gentlelady from Guam, you mentioned the synaptic connections. We just rewrote the Head Start bill. And I was a key sponsor of that bill. That was written in 1965 originally, before they even knew about this physical structure, laying down the structure of the brain. But we incorporated all of that knowledge in Head Start because we know that I was rocking my week-old granddaughter the other night and talking to her, using her name even, talking to her. And that is part of the development of the brain right there. Thank you for bringing it up.

The gentlelady from Guam, Mrs. Bordallo.

Ms. BORDALLO. Thank you. Thank you very much, Mr. Chairman.

First let me say what an ideal setting this is, although I am a little warm. [Laughter.]

I shouldn't be. I am from an island. But the sounds of nature and all around us, I mean, it is beautiful. And we had such outstanding speakers, everything from the educators all the way down to the entrepreneurs.

I am the Chairman of the subcommittee in Natural Resources on fisheries, wildlife, and oceans. So I feel that I am in the right place this morning.

I have the distinction of having the veteran Mr. Kildee on my committee. And I am very pleased. He has had so many years in Congress; and, of course, my colleague who came into Congress at the same time as I did, Mr. Grijalva. The one that isn't a member is Mr. Sarbanes, but I think he will probably sign up next time around. [Laughter.]

Ms. BORDALLO. I have some questions, a couple of questions, for Dr. Grasmick and Ms. Harris, but I want to talk to the entrepreneur. I was real impressed with how you are so young and you have this company in which you have invested millions of dollars.

Would you say, Mr. Davidson, that—do you talk to other students now that you are in this company and you are developing this company? Do you talk to students of different ages to encourage them about the environment, like you are doing today? I mean, are there other instances where you may talk to them at schools?

Mr. DAVIDSON. I have, actually. I spoke at the Business Club at University of Maryland-College Park, talking about my experience and relating the environmental aspects of it as well. And to the people that I meet and do get to interact, I always—

Ms. BORDALLO. Do you think that we are making progress? Mr. Davidson, do you think students are more interested today than they were when you went to school? However, you are very young. So you just went a few years ago. Do you find the interest picking up?

Mr. DAVIDSON. It is. It is something talked about in the media all the time. And I think students—I have a younger brother that just graduated high school last year. And I think they are grappling with trying to make some of those connections because they hear about it all the time. So I have heard inquiries.

Ms. BORDALLO. The other question is the governor mentioned about the need to include a range of stakeholders in environmental education partnerships. Can you discuss the importance of includ-

ing businesses, particularly environmentally aware businesses, in such partnerships? Would you encourage that?

Mr. DAVIDSON. I would, absolutely. You know, the businesses are part of the lifeblood of our economy. And nonprofit stakeholders have a lot of resources and experience in what they do. And so do businesses. And I think there is a strong interest in the business community that they can get involved in some way where they can lend their expertise or some resources.

Ms. BORDALLO. Was your education in environment all obtained here in the State of Maryland?

Mr. DAVIDSON. It was.

Ms. BORDALLO. Well, then we can congratulate all of the educators here. [Laughter.]

My last question, is your business profitable? It is getting there?

Mr. DAVIDSON. We have been producing biodiesel since November 2007.

Ms. BORDALLO. Good. I have a question now for Dr. Grasmick and Ms. Harris. You know, at this level it is very important to have parents involved. I was reading this book, not that I wasn't listening to the testimony, but I did read it about the oyster program and so forth and how the families are very much involved, the parents.

So what feedback have you received from parents on the impact of these environmental programs?

Ms. GRASMICK. I would say from a state perspective, it has been outstanding. We want to accelerate our efforts and get more parents engaged, but we also see our students through their exposure as being incredible ambassadors.

And I would just draw the analogy to the stop smoking campaign we had with our young people and all the dangers of smoking. And honestly there was nothing that engaged parents in a more profound way. Children would say, "I don't want to ride in the car with you if you are smoking. I am not going to ride in the car with you if you are smoking."

We are now doing the same things relative to those activities and energy conservation. And so children are saying to their parents, "We have to have energy conservation in our house. We have to recycle." Parents who would not necessarily pursue that, the children are really the ambassadors.

And so we do see this having a positive effect on the engagement. And that is a good thing because it is not only helping the parents to also appreciate all of the potential of the environment, but it is also ensuring that we have more interaction between children and parents. And that is an effort that we are continuing to make in the State of Maryland.

Ms. BORDALLO. And I feel it would be very embarrassing to parents to be told what to do and what not to do by their children.

Ms. GRASMICK. Absolutely.

Ms. BORDALLO. So certainly they should listen.

Ms. Harris?

Ms. HARRIS. We have several different goals in our school, but one of our goals is to involve not just our parent community but our business community as well. And so we have business partners that help us with our environmental projects. I have a group of

parents that work with the students to do our recycling program after school.

Any time we have children outside we have parents involved. They are there to help. They are there to teach. They are there to just supervise.

Just recently we had a school-wide environmental night. And the children and the parents both work through environmental projects together. Again it is how do you make that parent-child connection because that really will make the difference.

The children go home and talk about what they are learning. It is in our parent bulletin. It is on our announcements. And then they share that information with the parents. And it encourages the parents to do the same kind of thing.

Again, we are very blessed at Pot Spring that we have an enormous supportive parent population. And so they come for everything that we ask them for. And they come when we don't ask them just because they are involved and they want to be involved.

But I think that partnership, the partnership, with the local community is equally as important with businesses that are in the community, getting them to donate, either time or goods, to help with our projects that we are doing around the school.

And then they know what they are doing and they get involved. Our kids teach them as well.

Ms. BORDALLO. Yes.

Ms. HARRIS. So it has to be a whole effort. It really does.

Ms. BORDALLO. Well, we have gone a long time without speaking about the environment like we are doing in the last five to ten years. And it is just swelling as we go on.

And I commend the author of this legislation. I am excited about it. And I am very excited to initiate some of the programs in the territories, Mr. Sarbanes. So we must include states and territories in this legislation. [Laughter.]

Mr. SARBANES. That is my take-away.

Ms. BORDALLO. Thank you.

Thank you very much, an outstanding panel of witnesses today. Thank you very much. [Applause.]

Chairman KILDEE. I thank the gentlelady. I have no plans for a second round of questions. However, Mr. Sarbanes has a—

Mr. SARBANES. I have no questions, Mr. Chairman. I just wanted to make a couple of comments. One is to thank the panel, what a tremendous panel, to again salute Patuxent for making this available to us and all the others that help bring this together just on a logistical basis.

What I am taking away is that our children need to be outside for them, but they need to be outside for us. If we don't make that connection to the environment for the next generation, then we are all going to suffer for it. And I think we have been able today to shine a light on that.

The coalition that is supporting this legislation I want to thank them again. And then, finally, I want to thank the students who have been sitting here listening to this testimony, who showed us this morning all the exciting things that they are doing and, as Dr. Grasmick said, really are the ambassadors in so many ways. So we

are here doing this hearing for you, and I appreciate your attending it today.

Thank you, Mr. Chairman.

Chairman KILDEE. Thank you very much, John. I really appreciate, John, you putting together such a great panel. I mentioned I have been in Congress 32 years, and this is in the top one percent of panels that I have listened to, very, very good. [Applause.]

You know, we refer to any hearing we have outside of Washington, D.C. as a field hearing. What a field. [Laughter.]

And what a hearing, right? It is wonderful. And a hearing like this is a major step in advancing legislation like this. So, John, you have taken that first major step on that, which is a very, very important introduction. And this hearing has been very, very helpful.

So I want to thank all of you. Each one of you has made your contributions. You have overlapped, and you have coordinated. You reinforced individual ideas, all of these things. Again, I just want to thank you personally, thank the students particularly. You have been great. If you were my students, I would take you out to Sleepy Hollow also. [Laughter.]

I have to wrap up some of the legal things here now. As previously ordered, members will have seven calendar days to submit additional materials for the hearing record. Any member who wishes to submit follow-up questions in writing to the witnesses should coordinate with majority staff within the requisite time.

And, without objection, this hearing is adjourned.

[Additional submissions by Mr. Kildee follow:]

**Prepared Statement of Zenobia Barlow, Cofounder and Executive Director,
the Center for Ecoliteracy**

My name is Zenobia Barlow. I am cofounder and executive director of the Center for Ecoliteracy, a national nonprofit foundation based in Berkeley, California that is dedicated to education for sustainable living.

I am pleased to submit written testimony before the House Education and Labor Committee, subcommittee on Early Childhood, Elementary and Secondary Education, on "Environmental Education: Teaching Our Children To Preserve Our Future."

I want to thank Chairman Miller and Reps. McKeon, Kildee, and Castle for including much of the No Child Left Inside Act (H.R.3036) in the Education and Labor Committee's staff draft of the NCLB reauthorization bill and respectfully urge them to help achieve passage of the NCLI Act in this Congress. I also applaud them for their leadership in helping to close the achievement gap.

I have been engaged in education for sustainability for more than 17 years, and cofounded the Center for Ecoliteracy in 1995 with systems theorist and author Fritjof Capra (Tao of Physics, The Turning Point, Web of Life) and philanthropist and former CEO Peter Buckley.

Since then, the Center has provided financial, intellectual, and practical support to hundreds of schools committed to organizing their curriculum and community around environmental project-based learning, and reached thousands of educators through our active web and publishing programs. We have developed and offer seminars and professional development institutes attended by educators from across the United States and countries from every continent in the world. With support from the California Endowment, the W.K. Kellogg Foundation and other funders, we also developed the Rethinking School Lunch program, which has been widely adopted to assist schools in improving school lunches and making learning connections between food, health, and the environment in the curriculum.

Through our work, we have repeatedly seen how important it is that young people understand the web of life upon which we are dependent for our well-being. Making connections between what we do as individuals, families, communities, and nations—and the impact on the Earth—is the highest goal of education for the environment. It is also critical to all education that will prepare students for the world in which they will live.

As you know, the No Child Left Behind Act has done just the opposite—significantly narrowing the curriculum and diminishing the role of environmental education. This is a most untimely development with potentially devastating consequences for the future economic and environmental well-being of our nation.

With the rise of environmental problems such as global warming and worldwide food and water shortages, there is today an urgent need to prepare young people to meet the challenges that have already begun to destabilize our society and societies around the globe. There is also a vital need to help them learn what they need to know to create more sustainable societies in the future, societies that better harmonize human needs with those of the natural world upon which we depend.

This essential work can only be accomplished by advancing environmental education in K-12 schools nationwide—education in which experiences in nature are linked to classroom experiences that help students develop the knowledge, values, and skills to understand what they observe in nature. This kind of education also enables students to develop the ability to deal with downstream consequences of individual and community actions and the capacity to care about those who are affected.

The good news is that many school communities are integrating such indoor learning with outdoor experiences while promoting an understanding of the natural world as one interconnected system or biosphere, the web of life that holds all humanity and everything we value.

Now we must put the financial and institutional supports in place that will encourage and enable more educators to do the critical work of preparing America's young people for the environmental challenges and opportunities that lie ahead.

[Statement of Mr. Baker follows:]

Prepared Statement of William C. Baker, President, Chesapeake Bay Foundation

Thank you, Mr. Chairman and members of the Committee, for scheduling this field hearing here in the heart of the Chesapeake Bay watershed and for this opportunity to submit this statement for the record.

The Chesapeake Bay Foundation is the largest regional field-based environmental education program in the country. We work closely with schools and school systems throughout the watershed to provide teacher training and one and multi-day field experiences for students. Our programs are designed to engage students, deepen their understanding of their environment and support student achievement.

After nearly two decades of steady growth, our environmental education programs began to experience a noticeable drop in enrollment in the past few years. Other environmental education providers in the watershed and around the country told us they were experiencing similar declines. When we asked teachers and school administrators the reasons, they pointed to two things: pressure to improve test scores in reading and math and budgetary constraints.

This was happening at the same time that every report and indicator was suggesting that more, not less, time and effort should be devoted to environmental and outdoor education. For example:

- An annual report card on environmental attitudes, knowledge and behavior conducted by Roper Reports finds that two-thirds of all Americans fail an even basic environmental quiz.
- Two reports by the National Science Foundation published in 2000 and 2003 called for a systemic approach to environmental education.
- A nationwide study conducted by the State Education and Environment Roundtable found that environmental education has a measurably positive impact not only on student achievement in science, but also in reading, math, and social studies, when integrated into K-12 curricula or used as an integrating theme across the curriculum.
- Two reports to Congress by the National Environmental Education Advisory Council released in 1996 and 2005 called for raising the level of environmental literacy of Americans.

And it was happening at a time of growing recognition that people—and particularly our youth—are increasingly disconnected from nature, spending more time inside and not outside playing, exploring and learning. This trend was highlighted by Richard Louv in his book *Last Child in the Woods* and by one of today's witnesses, Oliver Pergams in a recent study published in the *Proceedings of the National Academy of Sciences* entitled "Evidence of a fundamental and pervasive shift away from nature-based recreation."

In an effort to address what we believe is a national crisis in environmental education, the Chesapeake Bay Foundation became a founding member of the No Child Left Inside Coalition—a diverse group of environmental, education, health and business organizations who care about environmental education. We came together just over a year ago with the goal of restoring and enhancing environmental and outdoor education in our nation's schools and school systems. From a handful of organizations, we now comprise 200 members, representing some 20 million people. In my judgment, this rapid growth reflects the deep concerns about this issue and the strong public support, across the spectrum, for restoring environmental education to our nation's indoor and outdoor classrooms. Polling data confirms this support, finding that 95% of Americans surveyed support environmental education in our schools.

The No Child Left Inside coalition enthusiastically supports the bipartisan legislation introduced by Representative John Sarbanes and Senator Jack Reed known as the No Child Left Inside Act. This legislation would amend the No Child Left Behind Act to provide incentives for states to develop and implement plans to ensure that students graduate from high school environmentally literate. It authorizes \$100 million a year in federal funding to states to train teachers in environmental education, to operate model environmental education programs, including outdoor learning, to support research and strategic initiatives to advance the field and to encourage states to develop and implement environmental literacy plans. These plans are critical to ensure that environmental education programs are fully integrated with NCLB and state goals to improve student performance and effectively reach the most students and teachers possible. We want to commend Governor O'Malley for his Executive Order establishing a partnership to develop and implement what we hope will be the first of many state environmental literacy plans. This Executive Order is an important step forward in ensuring that all of Maryland's students will receive a basic grounding in the environment.

Mr. Chairman, we have a tremendous opportunity with the No Child Left Inside Act to make a difference—for education, for the environment, and for our future. If NCLI is enacted, we will implement the recommendations of the studies I cited earlier and have a systemic approach to environmental education which will raise the level of environmental literacy of Americans. We will help meet the student achievement goals of the No Child Left Behind Act. We can help address the disturbing trends and health impacts of nature deficit disorder. And we will graduate a generation of students who are fundamentally prepared with the skills and knowledge to deal with the challenges they face on an individual, national and global basis—whether that's reducing their carbon footprint, or cleaning up Chesapeake Bay. I want to commend the Committee for holding this hearing and urge you to move swiftly to approve this critical legislation.

[The statement of Mr. Miller follows:]

Prepared Statement of Hon. George Miller, Chairman, Committee on Education and Labor

Good morning. I regret that I can not be here with Representative Sarbanes, Governor O'Malley, and our distinguished witnesses and guests today.

I'm looking forward to learning about helping students to connect with the environment.

When we teach students to face critical environmental issues like climate change, energy conservation, air pollution, habitat conservation, or the importance of protecting Chesapeake Bay, we are not only preparing them to be better stewards of the environment and all that that brings with it, but we are also preparing them to play an important role in strengthening our economy.

Environmental education has been with us for a long time, but it may be facing a change. Outdoor education, such as field trips to bays or local ponds, are fun and important. Those trips can be the first exposure a child may have to the splendor and fragility of nature, and the impact people have on it.

Now, we need to take environmental education to the next level. In addition to getting kids outdoors, which is so important, we must ensure that students learn about the environment as if our society and our local communities depended on it—because the fact is, they do depend on it.

The future health of our planet and the future success of our economy depend on students integrating environmental education into their overall education.

That is what is exciting about the Sarbanes bill and the overall issue of environmental education.

As more and more businesses 'go green,' we will need new crops of students who are capable of and excited about being environmental innovators—developing products and processes that are environmentally sound and economically important.

America's success in the world came from being innovative—in science and technology, in politics, and in education. We can continue to be a leader in the world for positive solutions to our world's problems by continuing to push forward with environmental technology, environmental science and environmental problem solving.

The schoolchildren of today are those future engineers, environmental scientists, and problem solvers.

I'm proud to say that California has been a leader in environmental education. There have been great statewide and local efforts to involve students with the environment. California is in the process of developing an Environmental Education Initiative to help integrate the subject into the classroom.

We can assist teachers and principals in addressing environmental education inside and outside the classroom. Environmental education is a powerful tool to help motivate students to take care of the environment and help improve the academic achievement of students.

I have been working with Representative Sarbanes on his legislation and in fact last year we included language from his bill, No Child Left Inside, into the discussion draft to reform No Child Left Behind that was the basis for discussions in the Education and Labor Committee and the larger education community.

The Sarbanes language would provide funding for environmental education professional development for teachers and also funding to help expand environmental education and disseminate information on proven environmental education programs. We will work with Rep. Sarbanes this year and next year as we find a way to move the k-12 reform agenda forward.

I'd like to thank Rep. Sarbanes for pushing this issue forward and I look forward to learning more about how Maryland is working to make environmental education a priority in its schools.

Thank you.

[The statement of Mr. Sarbanes follows:]

Prepared Statement of Hon. John P. Sarbanes, a Representative in Congress From the State of Maryland

Thank you Mr. Chairman. Again, I appreciate very much your willingness to conduct this field hearing. The whole idea here for today's hearing outdoors was to emphasize the point of bringing children from indoors to the outdoors by doing it ourselves. And, we were incredibly lucky with the weather, so thank you for allowing us to have this hearing outdoors as well.

Governor, your leadership with respect to the environment is well-known to Marylanders and is becoming well-known across the country. I thank you for your leadership. There is real synergy between what we're trying to do with No Child Left Inside (NCLI) and what you proposed with your executive order because NCLI is encouraging states to develop these environmental literacy plans and encouraging them by offering funding that can help support activities behind those.

Maryland is clearly positioning itself to be at the forefront of this important issue and to have that kind of environmental literacy plan. When it comes to the federal government Maryland, among other states, says we need the resources to support it. I think it's a great example of the partnership between the federal government and the state government. I am sure as you have attended these conferences of governors across the country you are hearing about the whole green job movement which is something that environmental education obviously sets up in a very constructive way.

Thank you Mr. Chairman. I also just wanted to emphasize a couple of things. First, I wanted to thank the staff here at the Patuxent Wildlife refuge for all the logistical support to make this hearing happen. I have been here numerous times to various events and every time it goes off without a hitch (I'll knock on wood since I know we're not finished but I think it will go on). I also want to thank the Education and Labor Committee staff for helping to make this day possible; Delicia Reynolds on my own staff is the point person—I want to thank her for her efforts. Most important, I wanted to make a point to thank the students that are here—really they are what it's all about.

The most important thing about Environmental Education and today's hearing is the mutuality dimension of caring for our environment, particularly with respect to

the Chesapeake Bay. The Chesapeake Bay watershed of course includes 6 states and DC. While soliciting support for the No Child Left Inside Act, I have gone to members of Congress who represent many different places across the Watershed and Bay area. I have talked to them about how much I care about a stream or river in their district. They have looked a little bit perplexed and wondered why, and then I explain because the watershed begins in your district—as far north in fact as Cooperstown, NY. The notion that we can escape the obligation for our environment by being a little bit more removed is delusional. The way we are going to save this bay, the Chesapeake Bay, the way you're going to save it, the way these students are going to save it is by tending to the needs of our environment again right there in your own backyard.

Somebody handed me this family circus cartoon from today. I didn't see it, but if any of you have not seen it, you should. It is a picture of these two boys (I don't know their names) but they are sitting under a tree, chewing a blade of grass, and one says to the other "this is my favorite learning place—Schoolhouse earth." And that's the point that we're trying to make here today.

[Additional submissions of Mr. Sarbanes follow:]

501 EAST PRATT STREET,
Baltimore, MD.

Hon. JOHN M. SARBANES,
U.S. House of Representatives, Washington, DC.

DEAR REP. SARBANES: Thank you for the opportunity to submit written testimony in support of the field hearing on Environmental Education: Teaching Our Children To Preserve Our Future held April 22, 2008 at the Patuxent National Wildlife Refuge.

We request the testimony be submitted for the hearing record.

Again, thank you for supporting environmental education through the No Child Left Inside Act.

Sincerely,

JOE HARBER, *Director,*
Education Programs, National Aquarium in Baltimore.

On behalf of the National Aquarium Institute, we are pleased to submit written testimony before the House Education and Labor Committee, subcommittee on Early Childhood, Elementary and Secondary Education, on Environmental Education: Teaching Our Children To Preserve Our Future.

We wish to thank Chairman Miller and Reps. McKeon, Kildee, and Castle for including much of the No Child Left Inside Act (H.R.3036) in the Education and Labor Committee's staff draft of the NCLB reauthorization bill and urge them to help achieve passage of the NCLI Act in this Congress. We applaud them for their leadership in helping to close the achievement gap.

We also wish to thank Rep. John P. Sarbanes for extending an invitation to attend the Congressional Field hearing on April 22, at the Patuxent Wildlife Research Center.

The National Aquarium Institute representing the National Aquarium in Baltimore, the National Aquarium in DC, the future Center for Aquatic Life and Conservation, and the National Aquarium Foundation is committed to providing environmental education programs to youth, adults and families. Our education and conservation programs contain many elements of import to this legislation.

The Aquarium's AquaPartners program uses the Chesapeake Bay watershed as a topic that is both engaging for students and teachers and critical to science and environmental education in Maryland. Further, it helps schools meet the 2010 Chesapeake Bay Agreement to provide all students with a "meaningful Bay experience." The program is designed to bring the science curriculum to life while offering young people, who do not have many occasions to see the world beyond their own urban environment, an opportunity to experience the wonders of the natural world. The program includes a Summer Workshop for teachers, classroom outreach during the year, and field study trips to the Chesapeake Bay at the Ft. McHenry Field Station and Sandy Point State Park.

Conservation is at the heart of the Institute's mission and programs. The Chesapeake Bay Initiative includes a volunteer corps that restores wetlands by planting beneficial marsh grasses, monitoring the health of created wetlands, and conducting outreach restoration events for local community groups.

In 2002 the Aquarium enhanced its existing community partnerships by providing area students with opportunities to grow wetland plants at their schools and partici-

pate in habitat restoration projects through the Wetland Nursery Program. Through this program, students contribute to restoration of Chesapeake Bay tidal wetlands, investigate the life cycle of plants and their importance to the estuarine ecosystem, help maintain wetland plant nurseries, test water quality, and gain problem-solving skills.

Since the 2002 inaugural year, the systems at several participating Wetland Nursery Schools have been upgraded to the AquaEcosystem, a system that also includes native Chesapeake Bay fish. In this integrated, closed-loop system, fish wastes fertilize the marsh grass, which in turn filters the water before it is returned to the fish. Students are responsible for regularly testing water quality and monitoring the growth of their fish. Aquarium staffers visit the schools and engage the students in activities that teach them about the Chesapeake Bay and the importance of wetland habitats.

These activities are supplemented by Aquarium-led field trips to restoration sites throughout the Chesapeake Bay, where students gain additional hands-on experience. After the plants and fish have grown for a few months, the students, accompanied by program staff, transplant the plants and release the fish at an Aquarium-sponsored restoration site.

Both the AquaPartners and AquaEcosystem Wetland Nursery programs incorporate outdoor educational experiences with classroom instruction. The classroom and field components are integrated into the school's curriculum, and aligned with State and national education standards.

Results of program evaluations show these programs significantly increases students' positive attitudes towards the Chesapeake Bay, and in addition, provide students with the knowledge and tools to make positive changes to the health of the Bay. Improving students' attitudes towards science is an important precursor to increasing student achievement.

The challenges facing the Chesapeake Bay and our world's oceans are immense. Depleted fish stocks, coastal development, and climate change are just a few of the challenges facing the citizens of this country and the world.

We need to equip the young people of today with the experiences, skills, and abilities to solve these growing problems. Environmental education experiences with direct contact with the natural world are critical to achieving that goal.

Again, we wish to thank Chairman Miller and Reps. Sarbanes, McKeon, Kildee, and Castle for their support and urge them to help achieve passage of the NCLI Act in this Congress.

Prepared Statement of Larry Schweiger, President and CEO, National Wildlife Federation

Thank you Chairman Kildee, Ranking Member Castle, Congressman Sarbanes and members of the Subcommittee for hosting this field hearing on environmental education and connecting children to nature. I appreciate the opportunity to submit testimony for the hearing record this Earth Day about importance of environmental education and the National Wildlife Federation's commitment to connecting people, especially children, with nature.

About the National Wildlife Federation

The National Wildlife Federation is the largest non-profit conservation, education, and advocacy organization with more than four million members and supporters throughout the United States. The National Wildlife Federation's family also includes forty-seven states and territorial affiliate organizations. Founded in 1936, the National Wildlife Federation works for the protection of wildlife species and their habitat, and for the conservation of our natural resources.

Overview

Looking out of my home-office window, I can see down a long forested valley across North Park to a far-away place appropriately called "wildwood" where nine decades ago, Rachel Carson and her mother Maria roamed the Pine Creek bottoms, explored rock outcrops and woodlands, listened to birds, and discovered spring wildflowers and insects. These hours in the fields of western Pennsylvania profoundly influenced one of the 20th century's greatest women by fostering a rich sense of wonder and profound love of nature.

Perhaps reflecting on her wildwood walks with her mother Rachel wrote later in life, "If a child is to keep alive his inborn sense of wonder without any such gift from the fairies, he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in."

Rachel would be deeply saddened by what has happened to the traditional connection between Americans and the outdoors, something that is markedly different than anything in our past. The evidence is everywhere. The average child today spends more than 6 hours daily watching TV, playing video games or operating a computer. Meanwhile, the amount of time U.S. children now spend outdoors has declined by 50 percent in the past 20 years.

An important connection between being outdoors and caring for nature is being broken, and it greatly concerns me. Children who fish, camp and spend time in the wild before age 11 are much more likely to grow up to be environmentally committed as adults, report Cornell University researchers. It was for me.

As a child, I spent many hours outdoors with my father, who was a dog trainer and hunter. He died more than 30 years ago, yet when I go to the woods and smell a familiar plant or hear a distant crow on a crisp fall day, my memories of being with Dad come flooding back in rich detail, as if it were yesterday. In those moments I can hear his voice clearly and I can see his ruddy face in the golden light of an early morning sun. I cherish those memories.

Although many environmental advocates speak of early experiences in nature that formed their connection, people of all professions often talk fondly of childhood experiences outdoors. Most adult Americans had a childhood where they could “go outside and play,” four little words rarely heard today.

What will become of wild places, if children know little of the mystery, the grace, the interconnectedness of all living things? How will we address global warming and other environmental threats if we do not engage and prepare the next generation for these monumental challenges? We only save what we love and we only love what we know.

It’s time to take action. As one of the largest conservation organizations in the country, the National Wildlife Federation is committed to helping children “rediscover the joy, the excitement, and the mystery” of our world.

National Wildlife Federation, with over 70 years of experience inspiring and fostering a connection with nature and wildlife continues to lead the way. Our award-winning Ranger Rick magazine for children has sparked curiosity about nature and wildlife in generations of children. Every month it delivers engaging stories, wildlife images and ideas for fun outdoor activities. In response to increasing demand for age appropriate magazines about animals for younger children, National Wildlife Federation also offers Your Big Backyard and Wild Animal Baby magazines for families with children 3-8.

With tens of thousands of certified Backyard Wildlife and Schoolyard Habitats, our wildlife gardening programs help individuals and families attract birds, butterflies and other local wildlife to backyards across the country. A more recent addition to the suite of fun family outdoor activities is the National Wildlife Federation’s Great American Backyard Campout, which is reconnecting families, neighborhoods and entire communities through camping, by sharing campfire stories and eating s’mores.

To encourage parents and caregivers to make time for children to “go outside and play,” National Wildlife Federation launched Green Hour, www.greenhour.org, a source of information and inspiration to create daily free time outside for children.

What Is at Stake?

Children are no longer spending time playing outside. Today’s kids spend six and a half hours a day “plugged into” electronic media. Research shows that children are spending half as much time outside as they did 20 years ago. In his 2005 book, *Last Child in the Woods*, Richard Louv described this American trend. He gave this alarming problem a powerful name. Today’s kids suffer from a “nature deficit.”

The Health of Our Children. Nature deficit has had profound impacts on our children’s mental and physical health. Over the past 20 years, time spent playing outdoors has been cut in half, but the childhood obesity rate has more than doubled and the adolescent obesity rate has tripled. Doctors warn that, for the first time in American history, life expectancy may actually decrease because of the health impacts of the current childhood obesity epidemic.

Research has linked childhood obesity to a lack of playtime outdoors. Although physical activity through organized sports can help address childhood obesity, the medical community recognizes that unstructured free time outdoors has unique health benefits to children. Children who play outside are more active and more physically fit. Time in nature improves children’s academic performance, concentration, balance, coordination, and self-esteem. Recent studies indicate that playing outside even reduces the severity of symptoms of Attention Deficit/Hyperactivity Disorder (ADHD), which affects millions of American children.

The Economy. The economic impacts of nature deficit are significant. The costs of the childhood obesity epidemic to our public health systems could reach \$100 billion annually. Hunting and fishing licenses sales have stagnated, resulting in severe cuts to state resource agencies' budgets. A decline in outdoor retail sales, a \$730 billion a year industry sector, may soon follow.

The Future of American Conservation. From the redwood forests to the Gulf Stream waters, exploring the diverse landscapes of America has shaped who we are as Americans. Children who spend time in nature are more likely to have pro-environmental attitudes as adults. Time spent in nature with an important adult often shapes a child's long-term environmental ethic. If this nature deficit continues unabated, we may face a dearth of environmental leaders, professionals, and advocates as we try to conquer future environmental challenges like global warming. We may also lose a unique aspect of our national culture and identity.

Solutions

We need to protect our children's future. To reverse nature deficit, National Wildlife Federation is working to reconnect children to nature through advocating for environmental education, educating our public health community about nature deficit, increasing opportunities for outdoor recreation experiences for children through better design and access, and embarking on a national public outreach campaign to encourage parents to build in regular time for outdoor play.

Several policy actions at the federal, state, local, and personal level can make a difference, although I will focus the remainder of my testimony on environmental education which would be strongly bolstered by passage of the No Child Left Inside Act (H.R.3036).

Hands-on, experience-based environmental education can reconnect kids to the natural world. The National Wildlife Federation supports policies that invest in and increase opportunities for environmental education to help reverse nature deficit. Environmental education programs use the environment as an integrating context (EIC) across disciplines, which often results in interdisciplinary, hands-on, community-based projects that affect the local environment. There is widespread public support for environmental education, with 95 percent of adults and 96 percent of parents supporting environmental education in public schools. Unfortunately, because of federal education legislation, known as the "No Child Left Behind" Act, many schools have reduced their environmental education budgets to meet these new testing and curriculum requirements.

There are four major types of outdoor education programs that serve to reconnect children to nature:

- (1) investigational approaches;
- (2) outdoor learning;
- (3) place-based learning; and
- (4) community service.

Traditional environmental problem solving in a community or "investigational approaches" have shown to increase test scores on environmental knowledge, reading, and writing skills. Outdoor learning programs like Outward Bound or the National Outdoor Leadership Schools have become "meaningful lifetime experiences" and often promote environmental stewardship. Place-based education connects the school to its immediate environment. Community service approaches advance responsible environmental behaviors and give children an opportunity to support local green spaces. Furthermore, experts note that if environmental education is done right it can be worth up to \$75 billion a year in measurable environmental benefits.

In addition to connecting kids to nature, integrating environmental education into school programs has proven academic benefits:

Sparks Interest in Science and Math as Future Career Pathways. According to the National Environmental Education Foundation, 80 percent of all students decide to opt out of science and math careers before entering high school. Environmental education is a "heuristic tool for making science more relevant and appealing," and "provides an appealing entry point for students thinking about future careers." In one study, educators observed thousands of students in environmental education programs and found that test scores improved across the board. Science was on the only subject where 100 percent of the students' scores improved.

Results in Better Math Scores. In a Houston schools study, fourth grade students who participated in the National Wildlife Federation's Schoolyard Habitat Program increased math scores significantly more than peers with a traditional curriculum. Overall, minority children showed more improvement.

Increases Academic Motivation and Attendance. A Washington state study concluded that students enrolled in environmental education programs showed better overall GPA improvements and increased attendance and motivation. Another study

showed that programs using the environment as an integrating context (EIC) had better student attendance rates 77 percent of the time and fewer discipline problems.

Closes the Gap in Underserved Communities and Serves as an Educational Equalizer. A 2004 study evaluated a place-based environmental education project in an under-resourced, predominantly African-American Louisiana school district. The performance gap between the district's performance and the state average on state educational tests improved across all subject areas. The National Environmental Education Foundation found that "environment-based education appears to be a kind of educational equalizer, improving reading, science achievement, and critical thinking across ethnic and racial groups and across socioeconomic levels."

Improves Critical Thinking Skills. A recent study examined over 400 high school students in eleven Florida high schools and contrasted students' critical thinking skills in environmental education programs and traditional classes. The environmental education classes significantly raised students' scores on two nationally recognized critical thinking skills tests. Teachers concluded that students' critical think-environmental programs involved interdisciplinary problem-solving approaches, empowered students by allowing them to choose their projects, and allowed students to connect their projects to their communities.

Higher Standardized Test Scores in Reading, Math, Science, and Social Studies. Numerous studies, including, an evaluation of student performance in 40 schools in 12 states implementing environment as an integrating context (EIC), show that students in EIC programs have higher scores in reading, writing, math, science, and social studies.

Increases Self-Esteem and Science Scores. In California, a comparison of at-risk sixth-grade students showed that students in hands-on environmental education significantly raised their science scores by 27 percent, and they showed better self-esteem, motivation, and behavior.

Thank you once again for hosting this field hearing on environmental education, a topic that is critical to the health of our planet and to the health and educational achievement of our nation's students. Thank you also to Education and Labor Committee Chairman George Miller and Ranking Member Buck McKeon for including much of the No Child Left Inside Act (H.R.3036) in the Education and Labor Committee's staff draft of the No Child Left Behind reauthorization bill. I urge you to pass the No Child Left Inside Act this year and I look forward to working with you.

[The statement of Ms. Woolsey follows:]

**Prepared Statement of Hon. Lynn C. Woolsey, a Representative in Congress
From the State of California**

Thank you, Chairman Kildee, for holding this hearing on such an important hearing: teaching our children about the environment and how children can play key roles in preserving our world's future. This is a topic that deserves more discussion and focus as we move towards reauthorizing No Child Left Behind and as we continue discussions on how to turn back the tide of global warming.

These environmental education programs, especially those that allow students to get out of school and into nature for more hands-on learning, provide invaluable lessons to our nation's children. The programs can also teach students to be good stewards of the earth and to become more active members in strengthening and preserving their community. If taught early, these students can go on to play important roles in protecting our environment.

Indeed, many students are being given the opportunity to make a difference now. One program has provided students in my District with the opportunity to participate in hands-on learning while also helping to bring back an endangered species. The Students and Teachers Restoring A Watershed (STRAW) Project in Marin County has provided teachers and students with the opportunity to learn about science and the importance of preserving our environment at the same time. STRAW grew out of the Shrimp Project, which was started in 1993 when a group of students and teachers worked together to try to find a way to bring back the endangered California freshwater shrimp, which was once prevalent but, by 1993, were only found in some areas of the Bay area creeks. These students worked together with their teachers, scientists, restoration specialists, environmental organizations, public land agencies, private landowners, and the community to take steps to determine what this species needed to survive and how they could provide this. These students participated in bird and aquatic insect studies, water quality monitoring, planting of native plants, nature writing, and other activities. Due, at least

in part, to their activities, within 2 years of the start of their project, the California freshwater shrimp began to make a comeback in the creek in which the students were working.

The STRAW project now reaches 1,200 K-12 students each year. They plant an average of 2,200 native plants a year at 25 different restoration sites, restoring about four acres of creek bank each year. These students also work on erosion control projects and removal of non-native and invasive vegetation. This project is a great example of how hands-on environmental learning can both compliment what students are learning in school while giving students the opportunities to learn how to be protect the environment. These students have been able to learn about and practice scientific and mathematic principles and methods, as well as working on their writing and artwork. This kind of project teaches students how their subject areas can be tied together and how the students themselves can be connected to the community.

The Edible Schoolyard is another great example of how students can learn about protecting the environment while applying what they learn in the classroom to more real world concepts. In the 1990s, chef Alice Waters worked with the principal and teachers at the King Middle School in Berkeley, California, and members of the community to turn an abandoned lot adjacent to the school into a garden. Students and teachers participated in everything from removing asphalt and putting down soil to designing the garden. Today, the program is a key part of the middle school where students garden and learn about cooking nutritional meals out of what they've grown. Students are learning about nutrition, ecology, and how they can be connected to and thus good stewards of land. Since the creation of the Edible School Garden at King Middle School, similar models have sprung up all over California and across the nation. Many of these great programs are in my District.

These programs are just two examples of the potential of offering environmental education programs to our schoolchildren. As we look towards ensuring that every student has the best possible education, we cannot forget that the best education educates the whole child. Children must continue to have access to all subjects, not just those that are tested. Environmental education is one great way to tie together so many of these important subjects and lessons while also teaching students about their environment and how to play an integral role in preserving it for their future and the future of their children and grandchildren. I look forward to working together to find ways to promote and encourage environmental education and continuing to create these future stewards of the environment.

[Additional material submitted by Governor O'Malley follows:]

EXECUTIVE ORDER (01.01.2008.06)

Maryland Partnership for Children in Nature

WHEREAS, The natural world is a successful model for many values that human communities seek: continuity, stability and sustenance, adaptation, sustained productivity, renewal without exhaustion of resources, and thriving in an environment of diversity;

WHEREAS, To sustain the natural world in Maryland-including the Chesapeake Bay and hundreds of thousands of acres of diverse land and habitat-requires the stewardship of future generations and business leaders;

WHEREAS, Stewardship is not possible without a strong sense of connection to the natural world;

WHEREAS, Maryland's children are losing their connection with our natural world, an alienation that threatens the future of Maryland's great natural resources and the quality of life for future citizens, diminishes use of the senses, creates attention difficulties and causes higher rates of physical and emotional illness and obesity;

WHEREAS, Spending frequent time outdoors in unstructured and structured experiences is the best way to develop a connection to nature and the foundation on which to build an environmental stewardship ethic;

WHEREAS, There is a need to continue and expand outreach that will engage individuals and organizations in the minority community in partnerships with State government in promoting a high standard of life through the conservation, restoration and preservation of natural resources;

WHEREAS, Environmental education increases student engagement in science, improves student achievement in core subject areas, and increases student aware-

ness about individual actions they can take to restore the health of the natural environment; and

WHEREAS, Maryland must renew its efforts to ensure that its children grow to become informed and responsible stewards of the environment and prepared for future environmental challenges and opportunities as individual citizens and as members of the workforce.

NOW, THEREFORE, I MARTIN O'MALLEY GOVERNOR OF THE STATE OF MARYLAND BY VIRTUE OF THE AUTHORITY VESTED IN ME BY THE CONSTITUTION AND THE LAWS OF MARYLAND, HEREBY PROCLAIM THE FOLLOWING EXECUTIVE ORDER, EFFECTIVELY IMMEDIATELY:

A. Established. There is a Maryland Partnership for Children in Nature (The Partnership) to promote outdoor experiential activities and environmental education for Maryland's young people and to build a coalition of ongoing support for these endeavors.

B. Membership. The Partnership shall include the following members:

- (1) The Secretary of Natural Resources, or the Secretary's designee;
- (2) The Superintendent of the State Department of Education, or the Superintendent's designee;
- (3) One representative of the Chesapeake Bay Trust;
- (4) Two representatives of non-profit organizations dedicated to environmental education;
- (5) One representative of the Maryland Association for Environmental and Outdoor Education;
- (6) One representative of a Parent Teacher Organization
- (7) Two representatives of local governments that have demonstrated leadership in sustainable development practices;
- (8) One representative (teacher or principal) from a Maryland Green School that has completed a Schoolyard Habitat project;
- (9) Two representatives of urban youth-based organizations;
- (10) One representative of the Maryland Recreation and Parks Association;
- (11) One representative of the pediatric medical field;
- (12) A former member of the Task Force on Minority Participation in the Environmental Community;
- (13) Two representatives of the business community with demonstrated leadership in supporting children in nature; and
- (14) One representative of the National Wildlife Federation.

C. Appointment and Terms. The members identified in B(3) through B(14) of this Executive Order shall be appointed by the Governor, with the advice of the Secretary of Natural Resources and the Superintendent of Education. Such members shall serve at the pleasure of the Governor for 2-year terms.

D. Meetings. The Partnership shall meet at the call of the Chairs.

E. Procedures. A majority of the Partnership constitutes a quorum for the transaction of any business. The Partnership may adopt any other procedures and by-laws necessary to ensure the orderly transaction of business.

F. Expenses. Members of the Partnership shall serve without compensation for their services, but they may receive reimbursement for reasonable expenses incurred in the performance of their duties in accordance with the Standard State Travel Regulations and as provided in the State budget.

G. Consultation. The Partnership shall consult with and engage leadership and staff from all other Maryland Executive Departments and independent agencies, federal and local government representatives.

H. Chair. The Partnership shall be co-chaired by the Secretary of Natural Resources, or the Secretary's designee, and the Superintendent of Education, or the Superintendent's designee.

I. Staff Coordination. The Department of Natural Resources shall provide staff support for the Partnership in coordination with the State Department of Education and other State agencies and other partners as directed by the Chairs.

J. Working Groups. The Partnership shall be supported by working groups, to be established by the Chairs, to lead the major tasks identified under this Executive Order.

K. Responsibilities. The Partnership shall promote the well-being of youth by providing opportunities for increased time spent outdoors and environmental literacy through outdoor experiential activities and formal and non-formal environmental education. The Partnership shall:

- (1) Develop and implement a plan to provide youth with structured and unstructured opportunities for play, outdoor recreation, learning and scientific study to include:

(a) Strategies that provide increased support for Schoolyard Habitat Programs, which support the conversion of schoolyards to natural habitats for play and outdoor classrooms;

(b) Creation of trails to connect communities, parks and schools via trail systems that encourage walking, biking and increased time outdoors by youth and families;

(c) Greening initiatives that create nature play areas within communities to provide outdoor experiences for children close to home;

(d) A statewide Civic Justice Corps to provide at-risk youth with opportunities to serve in conservation crews in State Parks and other public lands in partnership with the Maryland Department of Juvenile Services and community non-profit organizations;

(e) An outdoor classroom program that provides voluntary curriculum-aligned programming and service learning opportunities on public lands in cooperation with local county school systems, local parks and non-profit organizations;

(f) Increased access to naturalists on State Parks and public lands to provide interpretive activities for children and families to enhance their discovery and enjoyment of Maryland's natural resources; and

(g) Increased opportunities for under-served communities to access Maryland State Parks and public lands through partnerships with organizations that serve minority students;

(2) Develop and implement a State Environmental Literacy Plan to include:

(a) A review of current environmental education efforts in Maryland schools, including the environmental education bylaw, the Chesapeake 2000 commitments, and student environmental literacy levels;

(b) Identification of curriculum necessary to develop environmentally literate students;

(c) Identification of model outdoor field and service learning experiences that can be integrated into the regular school curriculum;

(d) Professional development opportunities for in-service teachers, pre-service teachers, and non-formal environmental educators;

(e) Methods to annually measure and report at the State and local level, progress of public school students toward becoming environmentally literate graduates; and

(f) A process for revising or updating the environmental literacy plan every five years, or as needed;

(3) Devise a method of measuring baseline data and increased time spent in nature by children;

(4) Identify opportunities and barriers to support implementation of programs in local school systems and on public lands; and

(5) Present these plans and a status report on their implementation to the Governor by January 1, 2009.

GIVEN Under My Hand and the Great Seal of the State of Maryland, in the City of Annapolis, this 21st Day of April 2008.

MARTIN O'MALLEY,
Governor.

ATTEST:

DENNIS SCHNEPFE,
Interim Secretary of State.

[Whereupon, at 1:00 p.m., the Subcommittee was adjourned.]

